




ONTARIO SCHOOL OF PRACTICAL SCIENCE TORONTO

FACULTY OF APPLIED SCIENCE
AND ENGINEERING
OF THE
UNIVERSITY OF TORONTO

Calendar 1903-1904





Digitized by the Internet Archive
in 2017 with funding from
University of Toronto



CALENDAR

OF THE

Ontario

School of Practical Science.

(Affiliated to the University of Toronto.)

Faculty of Applied Science and Engineering
of the
University of Toronto.



Twenty-Sixth Session, 1903-1904,
TORONTO.

WARWICK BROS
& RUTTER &



TORONTO.

CONTENTS.

	PAGE.
CALENDAR	5
TIME TABLES	8
FACULTY	14
GENERAL DESCRIPTION	17
DEPARTMENTS	19
DIPLOMA	20
ADMISSION	22
FEES, DEPOSITS, ETC	23
ESTIMATED EXPENSES OF A REGULAR COURSE	24
FELLOWSHIPS	25
REGULATIONS	25
VACATION WORK	27 and 45
SUPPLEMENTAL EXAMINATIONS	27
EXEMPTIONS	28
PRIZES AND HONORS	28
REGULAR EXAMINATIONS	29
DEPARTMENT OF CIVIL ENGINEERING	31
" MINING ENGINEERING	34
" MECHANICAL AND ELECTRICAL ENGINEERING	37
" ARCHITECTURE	40
" ANALYTICAL AND APPLIED CHEMISTRY	43
FOURTH OR POST GRADUATE YEAR	47
DEGREE OF B.A.Sc.	49
PROFESSIONAL DEGREES	51
ACTS RESPECTING DOMINION AND ONTARIO LAND SURVEYORS	54
ONTARIO ARCHITECTS' ACT	56
SYNOPSIS OF COURSES OF LECTURES	56
STEAM ENGINE LABORATORY	67
HYDRAULIC	67
STRENGTH OF MATERIALS LABORATORY	68
CEMENT TESTING LABORATORY	68
METROLOGICAL	69
ELECTRICAL	69

CONTENTS—Continued.

	PAGE.
MINERALOGICAL	71
ASSAYING	71
MILL ROOM	72
CHEMICAL	72
PHYSICAL	73
MUSEUMS	73
LIBRARY	74
ENGINEERING SOCIETY	75
LODGING AND BOARD	75
GYMNASIUM	76
ATHLETIC CLUBS	77
THE TORONTO ENGINEER COMPANY	81
STUDENTS IN ATTENDANCE	82
PRIZEMEN	91
GRADUATES IN APPLIED SCIENCE	93
" CIVIL ENGINEERING	95
" MINING ENGINEERING	95
" MECHANICAL ENGINEERING	95
" ELECTRICAL ENGINEERING	95
GRADUATES OF SCHOOL OF PRACTICAL SCIENCE	97
CERTIFICATES	114
INDEX TO GRADUATES	115

CALENDAR 1903 – 1904.

1903.	Sept.	24	Meeting of Council.
		28	Supplemental Examinations begin.
		30	Registration of Students.
	Oct.	1	First term begins. Lectures and practical work begin. Last day for presentation of Vacation work.
		9	Meeting of Council.
		14	Meeting of Engineering Society.
		28	Meeting of Engineering Society.
	Nov.	11	Meeting of Engineering Society.
		13	Meeting of Council.
		25	Meeting of Engineering Society.
	Dec.	9	Meeting of Engineering Society.
		11	Meeting of Council.
		22	First term ends.
1904.	Jan.	5	Second term begins.
		8	Meeting of Council,
		13	Meeting of Engineering Society.
		27	Meeting of Engineering Society.
	Feb.	10	Meeting of Engineering Society.
		17	Ash Wednesday, building closed.
		24	Meeting of Engineering Society.
	March	9	Meeting of Engineering Society.
		11	Meeting of Council.
		23	Meeting of Engineering Society.
		25	Annual meeting of Engineering Society.
	Apr.	1	Good Friday, building closed.
		8	Meeting of Council.
		9	Lectures and practical work close.
		15	Annual examinations begin.
		20	Last day for presentation of thesis for B. A. Sc.
		21	Examinations for B. A. Sc. begin.
	May	6	Meeting of Board of Examiners.
		9	Meeting of Council.
	June	10	University Commencement.

Candidates for Annual and Supplemental Examinations are required to give three weeks' notice, in writing, of their intention to take the same.

The building will be closed on all public holidays and daily at 1 p. m. during July and August.

1903.

SEPTEMBER.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..

OCTOBER.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..

DECEMBER.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..

1904.

JANUARY.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

FEBRUARY.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	..	..	..	..	..
..

1904.

MARCH.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..

APRIL.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..

JUNE.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	..	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	..	..

JULY.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST.

SUN.	MON.	TUE.	WED.	THU.	FRI.	SAT.
..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..

TIME TABLE—FIRST YEAR.
SESSION 1903-1904.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	
9-10	*Analytical Geometry, 1, 2, 3, 4 Chemical Lab'y, 5	*Trigonometry.	*Algebra.	*Euclid.	*Trigonometry.	9-10
10-11	*Electricity and Magn'm, 3, 5 (a) Electricity, 3, 5 (b) History of Arch'e, 4 Drawing, 1, 2	Drawing.	*Electricity and Magn'm, 3, 5 (a) Drawing, 1, 2, 4 do 3, 5 (b)	Drawing. *Heat,	(a) *Elect'y & Magn'm, 3, 5 (a) (b) Electricity, 3, 5 (b) Pen and Ink, Drawing, 1, 2	10-11
11-12	Statics, 1, 2, 3, 4 do 5 (a) Chemical Lab'y, 5 (b)	Dynamics.	Drawing.	Dynamics.	Statics, 1, 2, 3, 4 do 5 (a)	11-12
12-1	Surveying, 1, 2, 3, 4 Chemical Lab'y 5	Chemistry.	Chemistry.	Chemistry.	Descriptive Geometry.	12-1

2-3	*Mineralogy, 1, 2, 4, 5 Drawing, 3 (a) Chemical Lab'y, 3 (b)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 2, 5 (b) Drawing, 1, 3, 4 (b)	Chem'l Lab'y, 5 do, 1, 4 (b) Electrical Lab'y, 3, 5 Drawing, 2, 3 do, 1, 4 (a)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 3, 5 (b) Drawing, 1, 2, 4 (b)	Chemical Lab'y, 5 Electrical Lab'y, 3, 5 Field Work, 1, 2, 4 (a) Drawing, do, 1, 2, 4 (b)	2-3
3-4	*Mineralogical Lab'y, 1, 2, 5 (a) Drawing, 3 (a) do, 3 (b) Chemical Lab'y, 3 (b)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 2, 5 (b) Drawing, 1, 3, 4 (b)	Chem'l Lab'y, 5 do, 1, 4 (b) Electrical Lab'y, 3, 5 Drawing, 2, 4 do, 1, 4 (a)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 3, 5 (b) Drawing, 1, 2, 4 (b)	Chemical Lab'y, 5 Electrical Lab'y, 3, 5 Field Work, 1, 2, 4 (a) Drawing, do, 1, 2, 4 (b)	3-4
4-5	*Mineralogical Lab'y, 1, 2, 5 (a) Drawing, 3 (a) do, 3 (b) Chemical Lab'y, 3 (b)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 2, 5 (b) Drawing, 1, 3, 4 (b)	Chem'l Lab'y, 5 do, 1, 4 (b) Electrical Lab'y, 3, 5 Drawing, 2, 4 do, 1, 4 (a)	*Physical Lab'y, 3, 5 (a) Field Work, 1, 2, 4 (a) Chemical Lab'y, 3, 5 (b) Drawing, 1, 2, 4 (b)	Chemical Lab'y, 5 Electrical Lab'y, 3, 5 Field Work, 1, 2, 4 (a) Drawing, do, 1, 2, 4 (b)	4-5

1. Civil Engineering ; 2. Mining Engineering ; 3. Mechanical and Electrical Engineering ; 4. Architecture ; 5. Analytical and Applied Chemistry. *University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

The work in the Physical Laboratory closes on Nov. 11, after which the students in departments 3 and 5 are expected to take drawing during the hours allotted to Physics.

Saturdays from 9-12 will be devoted to field work during the months of October and November, and to drawing during the remainder of the Session.

TIME TABLE—SECOND YEAR.

SESSION 1903-1904.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	
9-10	Descriptive Geom'y, 1, 2, 3, 4	Surveying (Lect.) 1, 2, 4 Electricity, 3	*Calculus, 1, 2, 3, 4	*Astronomy, 1 Lithology, 2 (a) Electricity, 3 History of Arch'e, 4	*Calculus, 1, 2, 3, 4	9-10
10-11	Drawing. Organic Chemistry 5	Applied Chemistry.	Spherical Trig'y, 1, 2, 3 (a) Orders of Arch'e, 4	Applied Chemistry.	History of Ornament, Drawing, 4 1, 2, 3	10-11
11-12	Theory of Mechanism, 3 Drawing, 1, 2, 4 *Inorganic Chem'y, 5	Chemical Lab'y.	*Hydrostatics, *Optics, (a) (b)	Geology, Drawing, 1, 2, 5 3	Theory of Mechanism, Drawing, 3 1, 2, 4 *Inorganic Chem'y, 5	11-12
12-1	Strength of Materials, 1, 2, 3, 4	Chemical Lab'y.	Strength of Materials, 1, 2, 3, 4	Metallurgy.	Dynamics, Drawing, 1, 2, 3 4	12-1

2-3	Chemical Lab'y, Mineralogical Lab'y, Electrical Lab'y, Drawing, do	2 (a) 1, 2 (b) 3 4 1 (a)	*Physical Lab'y, Mineralogical Lab'y, Field Work, Drawing,	1, 2, 4 (b) 5 1, 2, 4 (a) 3	*Physical Lab'y, 3, 5 (a) Drawing, do	1, 2, 4 (b) Mineralogical Lab'y, 5 Field Work, Drawing,	*Physical Lab'y, Chemical Lab'y, Field Work, Drawing,	3, 5 (a) 2 (b) 1, 2, 4 (a) 1, 3, 4 (b)	2-
3-4	Chemical Lab'y, Mineralogical Lab'y, Electrical Lab'y, Drawing, do	2 (a) 1, 2 (b) 3 4 1 (a)	*Physical Lab'y, Mineralogical Lab'y, Field Work, Drawing,	1, 2, 4 (b) 5 1, 2, 4 (a) 3	*Physical Lab'y, 3, 5 (a) Drawing, do	1, 2, 4 (b) Mineralogical Lab'y, 5 Field Work, Drawing,	*Physical Lab'y, Chemical Lab'y, Field Work, Drawing,	3, 5 (a) 2 (b) 1, 2, 4 (a) 1, 3, 4 (b)	3-4
4-5	Chemical Lab'y, Mineralogical Lab'y, Electrical Lab'y, Drawing, do	2 (a) 1, 2 (b) 3 4 1 (a)	*Physical Lab'y, Mineralogical Lab'y, Field Work, Drawing,	1, 2, 4 (b) 5 1, 2, 4 (a) 3	*Physical Lab'y, 3, 5 (a) Drawing, do	1, 2, 4 (b) Mineralogical Lab'y, 5 Field Work, Drawing,	*Physical Lab'y, Chemical Lab'y, Field Work, Drawing,	3, 5 (a) 2 (b) 1, 2, 4 (a) 1, 3, 4 (b)	4-5

1. Civil Engineering; 2. Mining Engineering; 3. Mechanical and Electrical Engineering; 4. Architecture; 5. Analytical and Applied Chemistry. *University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

The work in the Physical laboratory closes for department 3 on November 25, and for departments 1, 2, 4 on February 3, after which the students in these departments are expected to take drawing during the hours allotted to Physics.

Saturdays from 9-12 will be devoted to field work during the months of October and November and to drawing during the remainder of the Session

TIME TABLE—THIRD YEAR.

SESSION 1903-1904.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	
9-10	Thermodynamics, 1, 2, 3 History of Architecture, 4 *Biology, 5	Hydraulics, 1, 2, 3, 4	Thermodynamics, 1, 2, 3 Architectural Design, 4	Hydraulics, 1, 2, 3, 4	Mechanics of Machinery, 3 Principles of Drawing, 4 *Biology, 1, 2, 5	9-10
10-11	Metallurgy, 2, 5 Drawing, 1, 3, 4	Theory of Construction, 1, 4 do, 2, 3 (a) Chemical Lab'y, 2 (b) Mechanics of Machinery, 3 (b)	Compound Stress, 1, 3, 4 Drawing, 2 (a) Assaying, 2 (b)	Theory of Construction, 1, 4 do, 2, 3 (a) Chemical Lab'y, 2 (b)	Electricity, 1, 2, 4, 5 do, 3 (b)	10-11
11-12	Ore Deposits, 2 Drawing, 1, 3, 4	Astronomy and Geodesy, 1 Electricity, 3 Chemical Lab'y, 2 (b) Drawing, 4	Assaying, 2 (b) Drawing, 1, 3, 4	Astronomy, 1 Electricity, 3 Chemical Lab'y, 2 (b) Drawing, 4	Mining and Ore Dressing, 2 Drawing, 1, 3, 4	11-12
12-1	Applied Chemistry.	Mineralogy and Geology, 1, 2, 4, 5 Machine Design, 3	Assaying, 2 (b) Drawing, 1, 3, 4	Mineralogy and Geology, 1, 2, 4, 5 Machine Design, 3	Applied Chemistry	12-1

2-3	*Physical Lab'y, 3, 5 (a) Drawing, 1, 2 (b) do Plumbing, Heating and Ventilation, 4	Field Work, 1, 2, 4 (a) Electrical Lab'y, 3 Drawing, 1, 2, 4 (b)	Descriptive Geometry, 1, 2, 3, 4 (a) Theory of Least Squares, 1, 2, 3 (b) Drawing, 4 (b)	Field Work, 1, 2, 4 (a) Electrical Lab'y, 3 Drawing, 1, 2, 4 (b) *Practical Biology, 5	*Physical Lab'y, 3, 5 (a) do Field Work, 1, 2, 4 (b) Chemical Lab'y, 2 (b) Drawing, 3 (b)	2-6
3-4	*Physical Lab'y, 3 (a) *Organic Chemistry, 5 Drawing, 1, 2, 4 (b) do	Field Work, 1, 2, 4 (a) *Organic Chemistry, 5 Electrical Lab'y, 3 Assaying, 2 (b) Drawing, 1, 4 (b)	Drawing, 1, 3, 4 Chem. Lab'y, 2	Field Work, 1, 2, 4 (a) Electrical Lab'y, 3 Assaying, 2 (b) Drawing, 1, 4 (b) *Practical Biology, 5	*Physical Lab'y, 3, 5 (a) do Field Work, 1, 2, 4 (b) Chemical Lab'y, 2 (b) *Organic Chemistry, 5 Drawing, 3 (b)	3-4
4-5	*Physical Lab'y, 3, 5 (a) Surveying (Lect.) Drawing, 1, 2, 3, 4 (b)	Field Work, 1, 2, 4 (a) Electrical Lab'y, 3 Assaying, 2 (b) Drawing, 1, 4 (b)	Drawing, 1, 3, 4 Chem. Lab'y, 2	Field Work, 1, 2, 4 (a) Electrical Lab'y, 3 Assaying, 2 (b) Drawing, 1, 4 (b)	*Physical Lab'y, 3, 5 (a) do Field Work, 1, 2, 4 (b) Chemical Lab'y, 2 (b) Drawing, 3 (b)	4-5

1. Civil Engineering ; 2. Mining Engineering ; 3. Mechanical and Electrical Engineering ; 4. Architecture ; 5. Analytical and Applied Chemistry ; *University of Toronto. (a) First Term. (b) Second Term. Subjects not numbered are in common to all the departments. In the department of Analytical and Applied Chemistry all hours not otherwise allotted are to be spent in the laboratories.

The work in the Physical laboratory closes for department 3 on November 11, and for department 1 on March 17, after which the students in these departments are expected to take drawing during the hours allotted to Physics.

Saturdays from 9-12 will be devoted to Field Work during the months of October and November and to drawing during the remainder of the Session.

FOURTH OR POST-GRADUATE YEAR.

There is no regular time table for the work of this year. The time of the students is spent almost wholly in the engineering, chemical and assaying laboratories. The hours are from 9 a.m. to 5 p.m., every working day during the session. Lectures are given at such hours as suit the laboratory work.

FACULTY OF THE SCHOOL.

Principal J. GALBRAITH, M.A., LL.D.

Registrar A. T. LAING, B.A.Sc.

MEMBERS OF TEACHING STAFF:

J. GALBRAITH, M.A., LL.D. *Professor of Engineering (Chairman)*

W. HODGSON ELLIS, M.A., M.B. *Professor of Applied Chemistry.*

A. P. COLEMAN, M.A., Ph. D *Professor of Geology.*

L. B. STEWART, O.L.S., D.T.S. *Professor of Surveying and Geodesy.*

C. H. C. WRIGHT, B.A.Sc., Mem. O.A.A... *Professor of Architecture.*

T. R. ROSEBRUGH, M.A. *Professor of Electrical Engineering.*

J. MCGOWAN, B.A.Sc. *Lecturer in Applied Mechanics.*

G. R. MICKLE, B.A. *Lecturer in Mining.*

R. W. ANGUS, B.A.Sc. *Lecturer in Mechanical Engineering.*

J. W. BAIN, B.A.Sc. *Lecturer in Applied Chemistry.*

H. G. McVEAN, B.A.Sc. *Demonstrator in Mechanical Engineering.*

H. W. PRICE, B.A.Sc. *Demonstrator in Electrical Engineering.*

W. C. TENNANT, B.A.Sc. *Fellow in Civil Engineering.*

J. G. McMILLAN, B.A.Sc. *Fellow in Mining Engineering.*

W. E. WAGNER, B.A.Sc. *Fellow in Mechanical Engineering.*

M. V. SAUER, B.A.Sc. *Fellow in Electrical Engineering.*

E. G. R. ARDAGH, B.A.Sc. *Fellow in Chemistry.*

A. H. MCBRIDE, Grad. S. P. S. *Fellow in Drawing.*

E. V. NEELANDS, B.A.Sc. *Fellow in Surveying.*

M. C. BOSWELL, B.A.Sc. *Lecture Assistant in Chemistry.*

FACULTY.

MEMBERS OF THE FACULTY OF ARTS :

whose classes are attended by the Regular Students of the School :

JAMES LOUDON, M.A., LL.D.	<i>President and Professor of Physics.</i>
R. RAMSAY WRIGHT, M.A., LL.D.	<i>Professor of Biology.</i>
ALFRED BAKER, M.A.	<i>Professor of Mathematics.</i>
W. R. LANG, D.Sc.	<i>Professor of Chemistry.</i>
T. L. WALKER, M.A., Ph.D.	<i>Professor of Mineralogy.</i>
W. L. MILLER, B.A., Ph.D. ...	<i>Associate Professor of Physical Chemistry.</i>
W. J. LOUDON, B.A.	<i>Associate Professor in Physics,</i>
C. A. CHANT, M.A.	<i>Lecturer in Physics.</i>
J. C. MCLENNAN, B.A., Ph.D.	<i>Associate Professor in Physics.</i>
ALFRED T. DELURY, B.A.	<i>Associate Professor in Mathematics.</i>
E. F. BURTON, B.A.	<i>Fellow in Mathematics.</i>
G. R. ANDERSON, M.A.	<i>Assistant in Physics.</i>
J. S. PLASKETT, B.A.	<i>Assistant in Physics.</i>

SCHOOL OF PRACTICAL SCIENCE.

PROVINCE OF ONTARIO.

CALENDAR FOR THE SESSION 1903-1904.



THE Legislative Assembly during the Session of 1877 gave its sanction to the establishment of a School of Practical Science on the basis proposed in the memorandum of the Minister of Education confirmed by the Lieutenant-Governor in Council on the 3rd day of February, 1877.

By the scheme thus approved of, the Government effected an arrangement with the Council of University College whereby the students of the School of Practical Science enjoyed full advantage of the instruction given by its professors and lecturers in all the departments of science which were embraced in the work of the School.

This arrangement was brought to an end in 1889 by the transfer of the departments of science above referred to, from University College to the University of Toronto under the operation of the University Federation Act.

In order that the students of the School might continue to enjoy the advantage of the instruction of the above departments, the Senate of the University of Toronto passed a Statute in October, 1889, affiliating the School to the University, which Statute was confirmed by the Lieutenant-Governor, on the 30th day of October, 1889.

By an Order-in-Council, approved by the Lieutenant-Governor, on the 6th day of November, 1889, a Principal was appointed, and the management of the School was entrusted to a council composed of the Principal as chairman, and the Pro-

tessors, Lecturers and Demonstrators appointed on the Teaching Faculty of the School.

By an Order-in-Council dated the 30th day of January, 1903, the Council of the School was made to consist of the Principal, the Professors and the Lecturers, together with the Registrar.

The management and discipline of the School is vested in the Council.

By a Statute of the Senate of the University of Toronto, passed on December 14th, 1900, the teaching staff and examiners of the School of Practical Science, together with the examiners for the degree of B. A. Sc. and professional degrees in Engineering, were constituted *ex officio* the Faculty of Applied Science and Engineering of the University of Toronto.

The statute is as follows :—

By the Senate of the University of Toronto,

Be it enacted :

1. That the Faculty of Applied Science and Engineering be hereby established.

2. That the courses and examinations of the School of Practical Science leading to the diploma of the school and to the special certificates of the school, together with the courses and examinations leading to the degree of Bachelor of Applied Science (B. A. Sc.), Civil Engineer (C.E.), Mining Engineer (M. E.), Mechanical Engineer (M.E.) and Electrical Engineer (E.E.), be the curriculum and examinations of the University in the said faculty.

3. That the members of the teaching staff of the School of Practical Science be the members of the teaching staff of the University in the said faculty.

4. That the examiners for the School of Practical Science, whether members of the teaching staff of the said school or otherwise, together with the examiners for the degrees named in clause 2, be the examiners of the University in the said faculty.

5. That the regular students of the School of Practical Science in the first, second, third and fourth years respectively be the undergraduates of the University in the corresponding years in the said faculty.

DEPARTMENTS.

6. That the non-regular, occasional and special students of the School of Practical Science to be the non-regular, occasional and special students of the University in the said faculty.

7. That the provisions of this statute apply, as far as may be, to all graduates of the School of Practical Science and to all graduates of the University in Applied Science and Engineering.

8. That no liability shall be incurred by the University of Toronto for the support and maintenance of the faculty hereby established.

CHEMISTRY AND MINING BUILDING.

The new building now in course of erection on College Street is designed to accommodate the instruction in Chemistry, Electro-Chemistry, Metallurgy, Assaying, Mineralogy, Geology and Mining. The Milling building will be separate from the main building and situated on the ground now occupied by old Wycliffe College. The Geological Museum will be temporarily housed in the eastern portion of the main building.

It is expected that the new buildings will be ready for occupation in January, 1904.

DEPARTMENTS.

There are five regular Departments of Instruction, in each of which Diplomas are granted, viz.:—

1. Civil Engineering.
2. Mining Engineering.
3. Mechanical and Electrical Engineering.
4. Architecture.
5. Analytical and Applied Chemistry.

The instruction given in each of these departments is designed to give the student a thorough knowledge of the scientific principles underlying the practice in the several professions, and also such a training as may make him immediately useful when he commences actual professional work.

DIPLOMA.

The regular course in each department is of three years' duration and leads to the Diploma of the School. The instruction is given partly in the lecture rooms and partly in the drafting rooms laboratories and field. A certain amount of the work is laid out for the summer vacation. The course of study in each department is general, and beyond the selection of his department the student has no opportunity to specialize.

DEGREE OF B. A. Sc.

After the general course is finished the Diploma of the School is granted and the student is at liberty either to enter the active life of his profession or to spend another year in special work. This year is called the fourth or post-graduate year. Graduates electing to proceed with their studies are allowed to select two subjects from an approved list, and are required to confine their whole attention to these subjects during the fourth year. The subjects on this list are such as require a large amount of time to be devoted to laboratory and other practical work. The advanced theoretical instruction is given either at the beginning or end of the working-day, in order not to break up the time allotted to practical work. During this year the student is required to prepare a thesis on some subject connected with his work. The practical examinations are held by the School, while the written examinations and the examination of the theses are held by the University. After complying with all requirements, the candidate receives from the University the degree of Bachelor of Applied Science (B. A. Sc.)

PROFESSIONAL DEGREES.

Bachelors of Applied Science may, after three years spent in professional work, present themselves for the degrees of Civil Engineer (C. E.), Mining Engineer (M. E.), Mechanical Engineer (M. E.), or Electrical Engineer (E. E.), as the case may be, subject to the rules and regulations established by the University.



This is to Certify that

*of the _____ in the _____
_____ has completed the Regular Course
of this School for the Diploma in the _____*

*_____ extending over a period of three years, and comprising theoretical
and practical instruction in the following subjects, viz:

_____*

*Wherefore the said _____
becomes duly entitled to receive this Diploma; having fulfilled
to the satisfaction of the Faculty of the School all the requirements
thereunto relating;*

*In witness whereof we have signed this Diploma at
Toronto, in the Province of Ontario, this _____ day of _____
One thousand eight hundred and _____
and have caused the Seal of this School to be hereunto affixed*

Chairman

Secretary

ADMISSION.

Candidates will be admitted as regular students in any of the regular departments of instruction on presenting satisfactory certificates of having passed either :

(a) The matriculation examination in Arts, in any University in His Majesty's Dominions, or in all the subjects of such matriculation examination except Latin and Greek, provided, however, that if an alternative be allowed by the University between either Latin or Greek and modern subjects (*e.g.* Modern Languages, Physics, Chemistry, etc.), the latter subjects must be taken if the former are omitted : or

(b) The Junior Leaving Examination of the Province of Ontario, including either French or German.

The case of the University of Toronto will serve as an illustration. The subjects for pass Junior Matriculation in Arts in the University of Toronto are : English Composition, English Literature, English Grammar, Algebra, Euclid, Arithmetic, History (British, Canadian and Ancient), Latin and any two of the following : Greek, French, German, Experimental Science (Physics and Chemistry). A candidate who desires to enter the School of Practical Science as a regular student, without taking Latin or Greek, will be required to present a certificate from the Registrar that he has passed in the following subjects :—English Composition, English Literature, English Grammar, Algebra, Euclid, Arithmetic, History (British, Canadian and Ancient), and any two of the following :—French, German, and Experimental Science, (Physics and Chemistry).

Applications for admission to the regular Departments based upon other certificates than those above mentioned will be considered by the Council. Such applications accompanied by the necessary certificates and information, must be in the hands of the Registrar of the School before September 20th.

Students intending to write at the High School Leaving Examination for the purpose of entering the School of Practical Science may do so without having previously passed the Primary Examination. Their papers must be endorsed "For admission to School of Practical Science."

Occasional Students will be permitted to attend such courses of instruction as the council may approve, and such students will not be required to present entrance certificates.

SESSIONAL FEES, DUES AND DEPOSITS.

These are payable in two instalments, one in each term.

A discount of two dollars will be made on each instalment if paid before the end of the first calendar month of the term in which it is due.

No student will be allowed to begin the work of a new term until the fees and dues of the previous term have been paid.

No application for examinations will be received until all fees and dues have been paid.

	DESCRIPTION OF PAYMENT	1.	2.	3.	4.	5.
		Civil Engineering.	Mining Engineering.	Mechanical and Electrical Engineering.	Architecture.	Analytical and Applied Chemistry.
		\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
I.	Payable in First Term—					
	Sessional Fees	34 00	34 00	34 00	34 00	34 00
	Dues—					
	Library	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory	3 00	3 00	3 00	3 00	3 00
	Mineralogical Laboratory .....	.....	.....	.....	.....	.....
		40 00	40 00	40 00	40 00	40 00
	Payable in Second Term—					
	Sessional Fees	35 00	35 00	35 00	35 00	35 00
	Total	75 00	75 00	75 00	75 00	75 00
II.	Payable in First Term—					
	Sessional Fees	40 00	40 00	40 00	40 00	40 00
	Dues—					
	Library	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory	3 00	3 00	3 00	3 00	3 00
	Mineralogical Laboratory	3 00	3 00	.....	.....	3 00
		49 00	49 00	46 00	46 00	49 00
	Payable in Second Term—					
	Sessional Fees	40 00	40 00	40 00	40 00	40 00
	Total	89 00	89 00	86 00	86 00	89 00

YEAR	DESCRIPTION OF PAYMENT	1.	2.	3.	4.	5.
		Civil Engineering.	Mining Engineering.	Mechanical and Electrical Engineering.	Architecture.	Analytical and Applied Chemistry.
		\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
III.	Payable in First Term—					
	Sessional Fees	45 00	45 00	45 00	45 00	45 00
	Dues—					
	Library.....	1 00	1 00	1 00	1 00	1 00
	Deposits—					
	General	2 00	2 00	2 00	2 00	2 00
	Chemical Laboratory		3 00			3 00
	Mineralogical Laboratory		3 00			3 00
		48 00	54 00	48 00	48 00	54 00
	Payable in Second Term—					
	Sessional Fees.....	45 00	45 00	45 00	45 00	45 00
	Total.....	93 00	99 00	93 00	93 00	99 00

The total expense of a regular three years' course in any department is about \$360, which amount includes books, instruments and materials as well as the fees, etc., stated in above table.

Information as to the text books, instruments and materials to be purchased by the students will be given on registration at the beginning of the session.

FOURTH OR POST-GRADUATE YEAR.—The fees, etc., in this year are as follows ;

Payable in First Term—

Sessional Fees.....\$35 00

Dues, Library..... 1 00

Deposits, General..... 2 00

Payable in Second Term—

Sessional Fees..... 35 00

University Fees..... 20 00

Total.....\$93 00

Fourth year students must also pay the deposits of the laboratories in which they work.

OCCASIONAL STUDENTS.—The fees payable by occasional students depend upon the nature and the amount of work taken ; they must be paid within one month from registration. All occasional students are required to pay the library due \$1, and the general deposit, \$2. Those taking laboratory work are required to pay a deposit of \$6.

Certificates will be granted to occasional students only in cases in which application has been made to the Council at the beginning of the session and the conditions of award arranged.

FELLOWSHIPS.

The following fellowships have been established : Civil Engineering, Mechanical Engineering, Electrical Engineering, Mining Engineering, Surveying, Drawing, Analytical and Applied Chemistry, Lecture Assistant in Chemistry

Each fellowship is of the value of \$500 per annum.

The Fellows are required to take such portions of the work of instruction as may be assigned to them by the Council.

Applications for these fellowships are to be made annually to the Registrar on or before the 1st day of May.

REGULATIONS RESPECTING EXAMINATIONS.

All students who are candidates for diplomas or certificates shall be in attendance at the school during the whole of each term, unless exempted by special permission of the Council. The term will not be allowed to any student who has attended less than three-fourths of the required lectures and practical lessons, or who has been reported to the Council for bad conduct and adjudged guilty thereof.

Candidates are required to send to the Registrar at least three weeks before the commencement of the Annual Examinations in April, and the Supplemental Examinations in September, notice in writing of their intention to take such examinations.

No candidate will be allowed to write at the Annual Examinations who has not paid all fees and dues for which he is liable.

The minimum percentage of marks required to pass in the written examinations will be fixed from time to time by the Council.

The minimum percentage of marks required to pass in the practical work connected with any subject shall be one and one-half times the minimum required in the case of a written examination.

In order to pass in subjects wherein both written and practical examinations are held, the candidate must pass in each examination.

In order to pass the practical examinations in the subjects of applied mechanics, descriptive geometry, surveying and architecture, the drawings set in the lectures on these subjects must be made.

Drawings prescribed for the first term of the session will not be counted unless finished in that term.

To pass in drawing, the drawings already referred to must be made, together with as many others as may be prescribed.

The number of practice sheets to be made by each student will depend upon his progress.

The minimum number of drawings shall be twenty-five and maximum number thirty-five, except in the Department of Analytical and Applied Chemistry, in which the numbers shall be fifteen and twenty-five respectively.

The minimum percentage of marks prescribed for practical work must be obtained in drawing.

The drawings must be made on paper 15 x 22 inches, unless otherwise prescribed.

The Council reserves the right of disposing of the drawings as they may think proper. No drawing may be removed from the school without permission.

To pass in Surveying the minimum percentage required for practical work must be obtained in the field work.

No drawings will be counted which have not been made in the drafting rooms, and during the hours allotted to such work.

No field notes will be counted which have not been taken in the field, and during the hours allotted to such work.

Vacation Work.

Vacation work must be handed in, on or before the first day of the session.

Vacation notes must be on construction only, and contain not less than twenty, nor more than thirty pages of sketches. These sketches must be free-hand pencil drawings with figured dimensions.

No notes, whether taken during the session or the vacation, will be counted unless made in the standard note books of the School.

Theses must be written on ordinary foolscap, and consist of not less than twenty, nor more than thirty pages.

Theses must be accompanied by carefully made drawings and illustrations separated from the text, and be bound between flat covers.

The sketches for theses in the Architectural Course are to be made on one side of the sheet of a sketch book and mounted on cardboard or paper.

The Architectural students are advised to spend the vacation in architects' offices.

The minimum percentage of marks required for practical work must be made in the case of vacation notes and theses.

Supplemental Examinations, Etc

A candidate below the standing of the third year, who has failed in one or two subjects, will be required to take supplemental examinations in such subjects.

In case a candidate has failed in both the written examinations and the practical work in a subject, it will be necessary for him to obtain the minimum percentage required for practical work in the written examinations, and do such extra practical work during the ensuing session as may be prescribed.

Should his failure have been in only the practical work of a subject he will be required to take a supplemental written

examination, and to do such extra practical work during the ensuing session as may be prescribed. If his failure has been in the written examination only, he will be required to take a written supplemental examination. In each of these cases the minimum percentage required for a written examination will be exacted.

The supplemental written examinations in subjects taught by the staff of the school will begin on the 28th of September, 1903. In other subjects they will be held at the time of the annual examinations.

In the case where a candidate fails to pass a supplemental examination it will count as one of the two supplemental examinations which may be allowed him after the next annual examination.

Candidates who fail in being promoted to a higher year or in graduating will be required to take again the whole course of instruction, both theoretical and practical, of the year in which they failed, before presenting themselves a second time for examination.

The fees to be paid by a student repeating a year will be the regular fees for such year.

Students are required to spend the hours of every working day between 9 a. m. and 5 p. m. at the work laid down in the time-table.

EXEMPTIONS.

No exemption from any of the regulations of the School will be granted, except under such circumstances as may be deemed sufficient by the Council. Application for exemption must be made in writing and the particulars of the case fully stated.

PRIZE.

The following prize has been established :

Civil Engineering, 3rd Year, \$10 in books. Donor— Mr. T. Kennard Thomson, C. E., New York.

HONORS.

Honors will be granted in each department to the students who pass in all the subjects and obtain at least 66 per cent. of the total number of marks allotted to the department at the annual examinations.

Papers read before the Engineering Society may be considered in granting Honors.

The Honor list will be arranged alphabetically.

REGULAR EXAMINATIONS.

(APPROXIMATE LIST.)

I Year.

EXAMINATIONS HELD AT THE END OF THE SESSION.

Algebra.	Dynamics.
Euclid.	Descriptive Geometry.
Plane Trigonometry.	Surveying..... 1,2,3,4.
Analytical Geometry 1,2,3,4.	Chemistry, Elementary.
History of Architecture.... 4.	Mineralogy..... 1,2,4,5.
Magnetism and Electric- ity 3,5.	Electricity..... 3,5.
Statics.	Heat.

EXAMINATIONS HELD DURING THE SESSION.

Drawing.
Field Notes 1,2,4.
Architectural Sketches..... 4.
Experimental Physics..... 3,5.
Practical Electricity..... 3,5.
Practical Chemistry.
Practical Mineralogy..... 1,2,5.
French and German..... 5.

II Year.

EXAMINATIONS HELD AT THE END OF THE SESSION.

Calculus 1,2,3,4.	Strength of Materials... 1,2,3,4.
Astronomy 1.	Rigid Dynamics. 1,2,3.
Optics.	Theory of Mechanism..... 3.
Hydrostatics.	Descriptive Geometry.....
History of Architecture.... 4.	..... 1,2,3,4.
Orders of Architecture.... 4.	Surveying..... 1,2,4.

-
- | | |
|--------------------------------------|---|
| 1. Civil Engineering. | 3. Mechanical and Electrical Engineering. |
| 2. Mining Engineering. | 4. Architecture. |
| 5. Analytical and Applied Chemistry. | |

History of Ornament.....4.	Spherical Trigonometry.....
Chemistry, Inorganic and .....	.....1,2,3.
Physical	Mineralogy.....1,2,4,5.
Chemistry, Applied.	Geology.....1,2,4,5.
Electricity	Lithology.....2.
.....3,5.	Metallurgy.

EXAMINATIONS HELD DURING THE SESSION.

Drawing .....	.....1,2,3,4.
Field Notes.....	.....1,2.
Construction Notes....	.....1,2,3,4.
Architectural Sketches.....	.....4.
Experimental Physics.	
Practical Electricity ....	.....3.
Thesis (at beginning of session.)	
Practical Chemistry.	
Practical Mineralogy....	.....1,2,5.
Practical Lithology.....	.....2.
French and German .....	.....5.

III Year.

EXAMINATIONS HELD AT THE END OF THE SESSION.

Magnetism and Electricity ..	3.	Theory of Construction.....
Electricity.		.....1,2,3,4.
History of Architecture	4.	Mechanics of Machinery
History of Ornament	4.	Machine Design
Principles of Decoration....	4.	Hydraulics
Elements of Design.	4.	Thermodynamics.....
Method of Least Squares....		Descriptive Geometry.....
.....	1,2,3.	.....1,2,3,4.
Chemistry, Inorganic and		Practical Astronomy and Geo-
Organic.	5.	desy.....
Chemistry, Applied.		Surveying and Levelling
Mineralogy and Geology....		.....1,2.
.....	1,2,4,5.	

-
- | | |
|------------------------|---|
| 1. Civil Engineering. | 3. Mechanical and Electrical Engineering. |
| 2. Mining Engineering. | 4. Architecture. |
- Analytical and Applied Chemistry.

Sanitary Plumbing, Heating and ventilation..4.	Metallurgy.....2, 5.
Theory of Compound stress	Mining and Ore Dressing..... 2.
.....1, 3, 4.	Ore Deposits..... 2.
	Assaying.. 2.

EXAMINATIONS HELD DURING THE SESSION.

Drawing.....	1, 2, 3, 4.
Field Notes	1, 2.
Construction Notes.....	1, 2, 3, 4.
Architectural Sketches.....	4.
Experimental Physics.. ..	1, 3, 4, 5.
Practical Electricity.....	3.
Thesis (at beginning of session).	
Practical Chemistry.....	2, 5.
Determinative Mineralogy.....	2, 5.
Assaying.....	2, 5.

DEPARTMENTS.

CIVIL ENGINEERING.

I Year.

MATHEMATICS.

Euclid, algebra, plane trigonometry.
Analytical plane geometry.

DRAWING.

Copying from the flat, lettering, topography.
Graphics.

Descriptive geometry in its application to plane-sided solids, orthographic (including isometric) and oblique projection.

Original Surveys.

CHEMISTRY.

General principles of chemistry.
Elementary chemistry.
Laboratory practice.

-
- | | |
|--------------------------------------|---|
| 1. Civil Engineering. | 3. Mechanical and Electrical Engineering. |
| 2. Mining Engineering. | 4. Architecture. |
| 5. Analytical and Applied Chemistry. | |

MINERALOGY.

Introductory course.

PHYSICS.

Heat.

MECHANICS.

Statics and dynamics (with special reference to structures and machines).

SURVEYING.

Field and office work, chain and compass surveys, topography, preliminary instructions in the use of the transit-theodolite, plotting, mensuration.

II Year.

MATHEMATICS.

Differential and integral calculus.

Spherical trigonometry.

Plane astronomy.

DRAWING.

Subjects of first year continued.

Coloring and shading applied to both topographical and construction drawing.

Descriptive geometry in its application to solids bounded by curved surfaces. The various projections of the sphere and principles of map construction.

Machines and structures. (Drawings made from both copies and original notes.)

CHEMISTRY

Advanced chemistry.

Thermo-chemistry.

Combustion.

Fuels.

Chemical manufacture.

Laboratory practice.

ENGINEERING AND SURVEYING.

Statics and dynamics (pure and applied.)

Strength and elasticity of materials.

ENGINEERING AND SURVEYING.—*Continued.*

Experimental work in engineering laboratory.
Transit-theodolite surveying.
Levelling.
Railway location curves, etc.
Hydrographic surveying.

MINERALOGY AND GEOLOGY.

Elements of these sciences.
Blowpipe practice.
Determination of minerals.

METALLURGY.

Iron and steel.

PHYSICS.

Hydrostatics.
Optics.

EXPERIMENTAL PHYSICS.

Introductory course.

VACATION WORK.

See pages 27 and 45.

III Year.

DRAWING.

Subjects of previous years continued.
Descriptive geometry—shades and shadows, stone cutting, perspective projection.
Original designs—bridges, roofs, floors, arches, etc.

CHEMISTRY (Applied).

Explosives.
Artificial lighting.
Photography,
Industrial chemistry.
Sanitary chemistry.

ENGINEERING AND SURVEYING.

Statics and dynamics (pure and applied).
Strength and elasticity of materials.
Theory of construction.

ENGINEERING AND SURVEYING.—*Continued.*

Practical designs—bridges, roofs, floors, arches, retaining walls, foundations, etc.

Thermodynamics and theory of the steam engine.

Hydraulics, sewerage, water supply.

Experimental work in engineering laboratory.

Levelling.

Profiles, cross sections, field work and plotting.

Computation of quantities.

Mathematical theory of surveying instruments.

Trigonometrical and barometrical levelling.

Geodesy considering the earth a sphere.

Practical astronomy (treated in the manner required for the O.L.S. and D.L.S. examinations.)

Least squares.

Electricity.

MINERALOGY AND GEOLOGY.

Economic geology.

EXPERIMENTAL PHYSICS.

Heat.

VACATION WORK.

See pages 27 and 45.

MINING ENGINEERING.

I. Year.

MATHEMATICS.

Euclid, algebra, plane trigonometry.

Analytical plane geometry.

DRAWING.

Copying from the flat, lettering, topography.

Graphics.

Descriptive geometry in its application to plane-sided solids, orthographics (including isometric) and oblique projection.

Original surveys.

CHEMISTRY.

General principles of chemistry.
Elementary chemistry.
Laboratory practice.

MINERALOGY.

Introductory course.

PHYSICS.

Heat.

MECHANICS.

Statics and dynamics, (with special reference to structures and machines).

SURVEYING.

Field and office work, chain and compass surveys, topography, preliminary instruction in the use of the transit-theodolite, plotting, mensuration.

II. Year.

MATHEMATICS.

Differential and integral calculus.
Spherical trigonometry.

DRAWING.

Subjects of the first year continued.
Coloring and shading applied to both topographical and construction drawing.
Descriptive Geometry in its application to solids bounded by curved surfaces. The various projections of the sphere, and principles of map construction.
Machines and structures from both copies and original notes.

CHEMISTRY.

Advanced chemistry.
Thermo-chemistry.
Combustion.
Fuels.
Chemical manufacture.
Laboratory practice.

ENGINEERING AND SURVEYING.

Statics and dynamics (pure and applied).
Strength and elasticity of materials.
Experimental work in engineering laboratory.
Transit-theodolite surveying.
Levelling.
Railway location, curves, etc.
Mining surveying.

MINERALOGY AND GEOLOGY.

Elements of these sciences.
Blowpipe practice.
Determination of minerals.
Lithology.

METALLURGY.

Iron and steel.

PHYSICS.

Hydrostatics.
Optics.

EXPERIMENTAL PHYSICS.

Introductory course.

VACATION WORK.

See pages 27 and 45.

III. Year

Drawing.

Subject of previous years continued.
Descriptive geometry.
Shades and shadows, stone cutting, perspective projection.
Original designs—bridges, roofs, floors, etc.

CHEMISTRY (APPLIED).

Explosives.
Artificial lighting.
Photography.
Industrial chemistry.
Sanitary chemistry.
Laboratory practice.
Wet assays.

ENGINEERING AND SURVEYING.

Statics and dynamics (pure and applied).
Strength and elasticity of materials.
Theory of construction.
Thermodynamics and theory of steam engine.
Hydraulics.
Experimental work in engineering laboratory.
Levelling.
Profiles, cross-sections, field work and plotting.
Computation of quantities.
Mathematical theory of surveying instruments.
Trigonometrical and barometrical levelling.
Least squares.
Electricity.

MINERALOGY AND GEOLOGY.

Economic geology.
Palæontology.
Ore deposits.
Blowpipe analysis and determinative mineralogy.
Metallurgy of gold, silver, nickle, copper, etc.
Mining and ore dressing.
Assaying.

VACATION WORK.

See pages 27 and 45.

MECHANICAL AND ELECTRICAL ENGINEERING.

I Year.

MATHEMATICS.

Euclid, Algebra, plane trigonometry.
Analytical plane geometry.

DRAWING.

Copying from the flat, lettering, graphics.
Descriptive geometry in its application to plane sided solids, orthographic (including isometric), and oblique projection.

CHEMISTRY.

General principles of chemistry.
Elementary chemistry.
Laboratory practice.

MECHANICS.

Statics and dynamics (with special reference to structures and machines.)

SURVEYING.

Application of trigonometry and principles of measurement (Lectures only.)

PHYSICS.

Heat.
Magnetism and electricity (introductory course.)
Electricity (applications of the laws of Ohm Kirchhoff and Joule.)

PRACTICAL ELECTRICITY.

Introductory course.

EXPERIMENTAL PHYSICS.

Introductory course.

II Year.

MATHEMATICS.

Differential and integral calculus.
Spherical trigonometry.

DRAWING.

Subjects of first year continued.
Coloring and shading applied in construction drawing.
Descriptive geometry in its application to solids bounded by curved surfaces.
Machines and structures, (Drawings made from both copies and original notes.)

CHEMISTRY.

Advanced chemistry.
Thermo-chemistry.
Combustion.
Fuels.
Chemical manufacture.
Laboratory practice.

ENGINEERING.

- Statics and dynamics (pure and applied).
- Theory of mechanism.
- Strength and elasticity of materials.
- Materials of construction.
- Methods and processes.
- Experimental work in engineering laboratory.

METALLURGY.

- Iron and steele.

PHYSICS.

- Hydrostatics.
- Optics.
- Electrical measurements.

EXPERIMENTAL PHYSICS.

ELECTRICAL LABORATORY.

VACATION WORK.

- See pages 27 and 45.

III. Year.

DRAWING.

- Subjects of previous year continued.
- Descriptive geometry.
- Shades and shadows, stone cutting, perspective projection.

CHEMISTRY (APPLIED).

- Explosives.
- Artificial lighting.
- Photography.
- Industrial chemistry.
- Sanitary chemistry.

ENGINEERING.

- Subjects of previous year continued.
- Applied mechanics :
 - Mechanics, of machinery, machine design, thermodynamics and theory of steam engine, hydraulics.
- Electricity.
- Dynamos and and moters.

Application of principles to practical problems connected with the design, construction and testing of various prime motors and machines.

Experimental work in engineering laboratory

Least squares.

EXPERIMENTAL PHYSICS.

Terrestrial magnetism.

ELECTRICAL LABORATORY.

ORIGINAL DESIGNS.

Engine and machine design.

VACATION WORK.

See pages 27 and 45.

In addition to taking the course of instruction in the school and passing the requisite examinations, a candidate for the diploma in Mechanical and Electrical Engineering will be required to present satisfactory evidence of having had at least one year's good practical experience in one of the principle trades connected with mechanical work, such as machinist, pattern-maker, moulder, steam engineer, etc. There is no restriction as to the place where the candidate may have gained such practical experience.

ARCHITECTURE.

I. Year.

MATHEMATICS.

Euclid, algebra, plane trigonometry.

Analytical plane geometry.

DRAWING.

Copying from the flat, lettering, topography, graphics, Descriptive geometry in its application to plane sided solids, orthographic (including isometric) and oblique projection.

Rendering in pencil and pen and ink.

CHEMISTRY.

General principles of chemistry.

Elementary chemistry.

Laboratory practice.

PHYSICS.

Heat.

MECHANICS.

Statics (with reference to structures).

Dynamics (preliminary to the study of hydraulics).

SURVEYING.

Principles, chain surveying, mensuration.

HISTORY OF ARCHITECTURE.

General introduction.

Ancient architecture.

Egyptian, Assyrian and Persian.

II. Year.

MATHEMATICS.

Differential and integral calculus.

DRAWING.

Instrumental drawing, drawing from the cast, sketching and water color, pen and ink.

Descriptive geometry (curved surfaces).

CHEMISTRY.

Advanced chemistry.

Thermo-chemistry.

Combustion.

Fuels.

Chemical manufacture.

Laboratory practice.

MECHANICS

Statics (pure and applied).

Strength and elasticity of materials.

Materials of construction.

Experimental work in engineering laboratory.

SURVEYING.

Use of transit and level.

Mensuration.

MINERALOGY AND GEOLOGY.

Elements.

METALLURGY.

Iron and steel.

PHYSICS.

Hydrostatics.

Optics.

EXPERIMENTAL PHYSICS.

Introductory course.

HISTORY OF ARCHITECTURE.

Greek and Roman.

Romanesque and Byzantine.

ORDERS AND ELEMENTS OF ARCHITECTURE.

HISTORY OF ORNAMENT.

Ancient.

Classic—Greek, Roman.

VACATION WORK.

See pages 27 and 45.

III Year.

DRAWING.

Descriptive geometry.

Shades and shadows, stone cutting, perspective projection.

Water color sketching.

Original designs—floors, trusses, arches, etc.

CHEMISTRY (APPLIED).

Explosives.

Artificial lighting.

Photography.

Industrial Chemistry.

Sanitary chemistry.

THEORY OF CONSTRUCTION.

Experimental work in engineering laboratory.

Electricity.

Hydraulics.

SANITARY SCIENCE.

House drainage and plumbing.

Ventilation and heating.

SURVEYING.

Levelling, setting out excavation, mensuration.

MINERALOGY AND GEOLOGY.

Economic Geology.

EXPERIMENTAL PHYSICS.

Heat, acoustics.

HISTORY OF ARCHITECTURE.

Gothic and Renaissance, with special reference to England.

ELEMENTS OF DESIGN.

Principles of planning with special reference to residences.

Relation between plan and elevations.

HISTORY OF ORNAMENT.

Early Christian : Gothic and Renaissance.

PRINCIPLES OF DECORATION.

VACATION WORK.

See pages 27 and 45.

ANALYTICAL AND APPLIED CHEMISTRY.

I Year.

MATHEMATICS.

Euclid, algebra, plane trigonometry.

DRAWING.

Copying from the flat, lettering.

Descriptive Geometry in its application to plane sided solids.

Orthographic (including isometric) and oblique projection.

Model drawing.

CHEMISTRY.

General principles of chemistry.

Elementary chemistry.

Laboratory practice.

MINERALOGY.

Introductory course.

MECHANICS.

Statics and dynamics.

PHYSICS.

Heat.

Magnetism and electricity.

EXPERIMENTAL PHYSICS.

Introductory course.

PRACTICAL ELECTRICITY.

Introductory course.

II Year.

CHEMISTRY.

Inorganic and physical chemistry.

Applied chemistry.

Laboratory work in quantitative and qualitative analysis.

MINERALOGY AND GEOLOGY.

Elementary mineralogy and blowpipe practice.

*Physical geography, palæontology and geology.

METALLURGY.

Iron and steel.

PHYSICS.

Hydrostatics.

Optics.

Electricity.

EXPERIMENTAL PHYSICS.

ELECTRICAL LABORATORY.

MODERN LANGUAGES.

Students in this and the following years are expected
to be able to read chemical books in French and
German.

VACATION WORK.

See pages 27 to 45.

*An option is permitted between the above subject and Inorganic Chemistry in the University of Toronto.

III. Year.

CHEMISTRY

Organic chemistry and chemical physics.
Applied chemistry.
Laboratory work.

MINERALOGY AND GEOLOGY.

† Economic geology.
Blowpipe analysis and determinative mineralogy.

METALLURGY.

Gold, silver, nickel, copper, lead.

EXPERIMENTAL PHYSICS.

Terrestrial magnetism.

BIOLOGY.

VACATION WORK.

See pages 27 to 45.

VACATION WORK.

THESIS AND CONSTRUCTION NOTES.

A subject is given at the end of each session on which the student is required to write a thesis accompanied by drawings and specifications (when necessary) during the subsequent vacation.

The engineering and architectural students are also required to make, during the vacation, full and clear notes of various constructions that may fall under their notice.

The value of both the thesis and the construction notes is taken into account in determining standing at the next annual examination.

CIVIL ENGINEERING.

SUBJECT OF THESIS FOR SECOND YEAR.—County and Suburban Roads.

“ THIRD YEAR.—The Disposal of City Wastes—Sewage, Garbage, etc.

† An option is permitted between above subject and Physical Chemistry in the University of Toronto.

Books of Reference.

Byrne—Highway Construction.

Judson—City Roads and Pavements.

Shaler—American Highways.

Spalding—Roads and Pavements.

Rafter and Baker—Sewage Disposal in the United States.

MINING ENGINEERING.

SUBJECT OF THESIS FOR SECOND YEAR.—Ore Dressing.

“ THIRD YEAR.—Mining.

Books of Reference.

Kuhnhardt—Ore Dressing in Europe.

Ihlseng—Manual of Mining.

MECHANICAL AND ELECTRICAL ENGINEERING.

SUBJECT OF THESIS FOR SECOND YEAR.—Machine Shop. Practice.

“ THIRD YEAR.—Foundry Practice.

Books of Reference.

Rose—Practical Machinist.

West—American Foundry Practice.

Spretson—Casting and Founding.

ARCHITECTURE.

For the Second year the following set of freehand pencil sketches is required:—

I. Doorway from the object.

II. Staircase “

III. Fireplace with cross section.

And seven sheets from the object, prints, or drawings, with plans and sections where possible.

SUBJECT OF THESIS FOR SECOND YEAR.—The above sketches.

“ THIRD YEAR—Twelve water-color studies

ANALYTICAL AND APPLIED CHEMISTRY.

SUBJECT OF THESIS FOR SECOND YEAR.—Sulphuric Acid Manufacture.

“ THIRD YEAR.—Manufacture of Chlorine, Bleaching Powder and Caustic Soda.

Books of Reference.

Lunge—Manufacture of Sulphuric Acid and Alkali.

Wagner—Chemical Technology.

Thorpe—Dictionary of Applied Chemistry.

Any other works on the above subjects may be consulted and results of original observation should be given.

THE FOURTH YEAR.

After the completion of the general three years' course in any department, students are recommended to take up the special work of the fourth year, leading to the degree of Bachelor of Applied Science in the University of Toronto. It is only by so doing that full advantage can be taken of the laboratory equipment of the school. The fourth year enables students to continue under certain restrictions the study of subjects in which they take special interest and is the means adopted in the School of Practical Science of affording them the advantage of elective and special studies.

To be admitted to the fourth year a candidate must be a graduate of the School of Practical Science or an under-graduate of the standing of the fourth year in the University of Toronto in the honor Department of Chemistry and Mineralogy.

The subjects of study in the fourth year are arranged in the following groups and sub-divisions :

- A. { Astronomy.
Geodesy and Metrology.
- B. { Architecture.
Strength and Elasticity of Materials.
Hydraulics.
Thermodynamics and Theory of Heat Engines.
Electricity and Magnetism.
- C. { Industrial Chemistry.
Sanitary and Forensic Chemistry.
Inorganic and Organic Chemistry.
- D. { Mineralogy and Geology.
Metallurgy and Assaying.

Each student will be required to confine his studies during the session to one of the above groups. He will not be allowed to take less than two nor more than three of the subdivisions in any group.

The subdivision "Inorganic and Organic Chemistry" will be obligatory on all students who select group C.

A student is liable to be called on to assist in any of the experimental and practical work in the group which he has selected, although it may not belong to his special subjects.

Candidates are required to notify the Registrar of the school in writing of their intention to take the fourth year work at least one week before the opening of the session, and to inform him at the same time of the subjects which they propose to take. These subjects will be submitted to the Council for approval at the beginning of the session, and no student will be permitted to take any subject not so approved.

Undergraduates of the University of Toronto of the standing of the fourth year in the Honor Department of Chemistry and Mineralogy may be admitted as students in the fourth year in the groups C and D.

Candidates will be required to show a good working acquaintance with translation from either French or German. This will be tested by their ability to translate extracts from scientific works or periodicals not previously specified.

Pass and Honors.

Total marks assigned to fourth year. 900

Subdivided as follows :—

Work (reckoned in hours)	540 marks
Records (notes, drawings, etc)	360 marks

FOR PASS.

The minimum percentages are :—

Work, 75 per cent	405 marks
Records, 50 per cent	180 "
And two-thirds of the total marks assigned....	600 "

FOR HONORS :

In deciding the allotment of honors the whole academic record of the candidate will be taken into consideration, but no honors will be granted unless the candidate shall have received a special recommendation from the member or members of Council under whose supervision his fourth year work has been done.

Honors granted will be mentioned in the certificate required under clause 2 of the statute of the University of Toronto respecting the degree of B. A. Sc.

The above certificate will not be granted to students who have been absent without leave of the Council from more than ten per cent. of the lectures and practical work of either term of the session.

Courses of reading will be indicated in connection with subjects of study.

The above regulations have been approved by the Senate of the University of Toronto in so far as they affect the degree of B. A. Sc.

DEGREE OF B. A. Sc.

Candidates who have fulfilled the requirements of the Fourth Year in the School of Practical Science are eligible for the degree of Bachelor of Applied Science in the University of Toronto in accordance with a statute passed by the Senate in 1892, which, with the amendments since made is as follows :

By the Senate of the University of Toronto.

Be it enacted :

That the Degree of Bachelor of Applied Science (B.A. Sc.) be hereby established to be granted subject to the following conditions and regulations :

1. Candidates for the said degree shall hold the diploma of the School of Practical Science in any one of the regular courses of the said School, or shall be of the standing of the fourth year in the Honor Department of Chemistry and Mineralogy in the University of Toronto.
2. They shall have fulfilled the conditions relating to the Fourth or Post-Graduate year in the School of Practical Science, and shall present certificates of having done so to the Registrar of the University. Honors may be granted with such certificates by the Faculty of the School.

Each candidate shall prepare a thesis based on the results of his Fourth Year work in the said School of Practical Science for the approval of the University examiners. This thesis must be sent to the Registrar not later than the day preceeding the first day of the annual examinations and is to be accompanied by all necessary drawings, specifications, tables and estimates. To pass in the thesis a candidate must obtain fifty per cent. and to take honors seventy-five per cent. of the marks assigned.

4. Candidates will be required to select two sub-divisions in any one of the following groups, and to pass such written and oral examinations on the subjects selected as may be prescribed by the University examiners.

- A. { Astronomy.
Geodesy and Metrology.
- B. { Architecture.
Strength and Elasticity of Materials.
Hydraulics.
Thermodynamics and Theory of Heat Engines.
Electricity and Magnetism.
- C. { Industrial Chemistry.
Sanitary and Forensic Chemistry.
Inorganic and Organic Chemistry.
- D. { Mineralogy and Geology.
Metallurgy and Assaying.

The sub-division "Inorganic and Organic Chemistry" will be obligatory on all candidates who select Group C.

To pass in each subject thirty-three per cent., and to take honors sixty-six per cent. of the marks assigned will be required.

5. The degree with honors will be conferred on candidates who obtain three out of the four honors possible, viz :

Certificates with honors (cl. 2)
Thesis with honors (cl. 3)
Honors in each subject of examination (cl. 4)

6. Candidates are required to send to the Registrar of the University at least three weeks before the commencement of the annual or supplemental examinations an application for examinations according to a printed form to be obtained from the Registrar, and such application must be accompanied by a fee of ten dollars.
7. The examination for the degree shall be held in April, and the supplemental examinations in September.
8. The fee for the degree shall be ten dollars and shall be paid to the Registrar not later than the day preceding the first day of the examination.
9. The ordinary time for conferring the degree shall be at the University commencement in June. The degree may be conferred at any meeting of the Senate.
10. The thesis, drawings, and other papers accompanying them, shall be the property of the School of Practical Science.
11. In case any change be made in the conditions referred to in the second clause, such change shall be submitted to the Senate, and shall have no force so far as the said clause is concerned unless approved by resolution of the Senate.

SUBSEQUENT PROFESSIONAL DEGREES.

The attention of graduates is directed to the following statute, passed by the Senate of the University of Toronto in 1896 :

By the Senate of the University of Toronto.

Be it enacted :

- I. That all previous Statutes of the University relating to degrees or diplomas in Engineering be repealed.
- II. That the following degrees be hereby established, viz., Civil Engineer (C.E.), Mining Engineer (M.E.), Mechanical Engineer (M.E.), Electrical Engineer (E.E.).
- III. That the following be the conditions and regulations governing the conferring of the said degrees.

1. A candidate for one of the said degrees shall hold the diploma of the School of Practical Science and the degree of Bachelor of Applied Science of the University of Toronto, except in the case provided for in clause 11 hereunder.
2. He shall have spent at least three years after receiving the degree of Bachelor of Applied Science in the actual practice of the branch of Engineering wherein he is a candidate for a degree.
3. Intervals of non-employment or of employment in other branches of engineering shall not be included in the above three years. It shall not be necessary that the several periods requisite to make up the said three years be consecutive.
4. Satisfactory evidence shall be submitted to the University examiners as to the nature and length of the candidates' professional experience for the purposes of clauses 2 and 3.

The Examiners shall satisfy themselves by oral or written examinations in regard to the candidate's experience and competence.

5. The candidate shall prepare an original thesis on some engineering subject in the branch in which he wishes a degree; the said thesis to be accompanied by all necessary descriptions, details, drawings, bills of quantities, specifications and estimates.

The candidates may be required at the option of the Examiners to undergo an examination in the subject of this thesis.

6. Notice in writing shall be sent to the Registrar not later than the first day of February, informing him of the degree to which the candidate wishes to proceed and of the title of his proposed thesis, for the approval of the Senate.
7. The evidence under clause 4, and the thesis, with accompanying papers, described in clause 5, shall be sent to the Registrar not later than the first day of April.

8. The candidate shall be required to present himself for examination in the month of April at such time as may be arranged by the Registrar.
9. The fee for any one of the said degrees shall be twenty dollars, and shall be paid to the Registrar not later than the first day of May.
10. The thesis, drawings and other papers submitted under clause 7 shall become the property of the School of Practical Science.
11. Candidates who graduated from the School of Practical Science before June, 1895, shall not be required to hold the degree of Bachelor of Applied Science.

For further particulars apply to the Registrar of the University of Toronto.

For the better carrying out of the provisions of the above statute the following statute constituting the Board of Examiners for professional degrees in Engineering was passed by the Senate on December 14th, 1900.

By the Senate of the University of Toronto—

Be it enacted :

1. That the Examiners for the degrees of Civil Engineer (C.E.), Mining Engineer (M.E.), Mechanical Engineer (M.E.), and Electrical Engineer (E.E.), be appointed at least twelve months in advance of the date of the examinations for which their services are required.
2. That the said Examiners constitute the Board of Examiners for degrees in Engineering.
3. That the members of the Board shall select one of their number to act as chairman, within one month from the date of their appointment.
4. That candidates for examination applying to the Registrar for information respecting the nature or details of the examinations for the said degrees, shall be directed by him to communicate with the chairman of the said Board, who shall forward to the candidates either directly or through the Registrar the decision of the Board.

5. That the Chairman of the said Board shall keep a record book in which he shall enter the minutes of the proceedings of the Board. He shall also keep a file in book form of all correspondence with candidates for examination and other official correspondence ; and shall at the close of the examination transmit to the Registrar a copy of the said minutes and correspondence.
6. That at the close of the examinations the Board shall forward a report of the results to the Registrar for transmission to the Senate. The report shall be signed by the Examiners or by the Chairman of the Board on their behalf.
7. That the Registrar shall furnish each Examiner on his appointment with a copy of this statute and a copy of the statute respecting degrees in Engineering.

Extract from the Provincial Act Respecting Land Surveyors and Survey of Lands. (R.S.O.)

“ 10.—(2) Any person serving as an apprentice as hereinafter provided, may, with the permission of the Board of Examiners, attend the Ontario School of Practical Science, or any school, college or university, the course of study in which is in the opinion of the Board sufficiently similar to that in the Ontario School of Practical Science, for the purpose of taking any course of study which includes any subject required for the final examination for admission to practice as a land surveyor, but the total period of such apprenticeship and of such course of study shall not exceed the period of four years from the date of the articles of apprenticeship as above mentioned, and not less than three years of the said period of four years shall be passed in the actual service of a practicing Ontario Land Surveyor.

“ 14. The privilege of a shorter term of apprenticeship shall also be accorded to any graduate of the Royal Military College at Kingston and of the Ontario School of Practical Science in civil or mining engineering, or of the McGill College, Montreal, in civil or mining engineering, and such persons shall not be required to pass the preliminary examination hereinbefore required for admission to apprenticeship with a land surveyor, but

shall only be required to serve under articles with a practicing land surveyor duly filed as required by section 17 of this Act, during twelve successive months of actual practice, after which, on complying with all the other requirements, he may undergo the examination by the Act prescribed."

"(2) Such person at any time during his apprenticeship may, with the permission of the Board of Examiners, attend the Ontario School of Practical Science, or any school, college or university, the course of study of which is, in the opinion of the Board, sufficiently similar to that in the Ontario School of Practical Science, for the purpose of taking any course of study which includes any subject required for the final examination for admission to practice as a land surveyor, but the total period of such apprenticeship, and of such course of study, shall not exceed the period of two years from the date of the articles of apprenticeship as above mentioned, and not less than twelve months of the said period of two years shall be passed in the actual service of a practicing Ontario Land surveyor.

Extract from the Dominion Lands Act.

"Every graduate in surveying of the Royal Military College of Canada, and every person who has followed a regular course of study in all branches of education required by this Act for admission as a Dominion Land Surveyor, through the regular sessions, for at least two years in any College or University where a complete course of theoretical and practical instruction in surveying is organized, and who has thereupon received from College or University a Diploma as Civil Engineer, shall be exempt from serving three years as aforesaid, and shall be entitled to examination after one year's service under articles with a Dominion Land Surveyor, at least six months of which service has been in the field, on producing the affidavit required by the next preceding clause as to such service; but it shall rest with the Board to decide whether the course of instruction in such College or University is that required by this clause."

The attention of the Candidates for the Diploma of D. T. S., given by the Dominion Board of Examiners, is directed to the facilities afforded for preparation in the School.

Extract from The Ontario Architects' Act.

" Any student who has matriculated in Arts in any University in His Majesty's dominions, or in the Ontario School of Practical Science, shall not be required to pass the preliminary examinations.

" 23. Any person who applies for admission to registration as an architect after the coming into force of this Act, shall be not less than twenty-one years of age, shall have served as a student not less than five years with a principal or principals entitled to register under this Act, or with any other principal or principals approved by the council, and have passed such qualifying examinations as may be required by this Act.

" 24.—(3) Any person who has graduated from the Ontario School of Practical Science shall be required to serve only three years as a student, one of which three years may be served during the vacation of such school.

" (4) Upon and after the passing of this Act, students shall serve such term as is required to be served by the provisions of this Act, under indenture to be a registered architect, which indenture and any assignment thereof with affidavit of execution thereto attached shall be filed with the Registrar upon payment of such fees as the council may by regulation direct."

SYNOPSIS OF THE COURSES OF LECTURES AND PRACTICAL INSTRUCTION.

Subjects Taught by the Faculty of the School.

Subjects.	Instructors.
Organic and Inorganic Chemistry,	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">}</div> <div> W. H. Ellis, M. A., M. B., Professor. J. W. Bain, B. A. Sc., Lecturer. E. G. R. Ardagh, B. A. Sc., Fellow. </div> </div>
Applied Chemistry, Assaying.	
Mineralogy, Geology, Petrography, Metallurgy, Mining and Ore-dressing, Milling, German.	
	<div style="display: flex; align-items: center;"> <div style="font-size: 3em; margin-right: 10px;">}</div> <div> A. P. Coleman, M.A., Ph. D., Professor. G. R. Mickle, B.A., Lecturer. J. G. McMillan, B.A.Sc., Fellow. </div> </div>

Subjects Taught by the Faculty of the School—Continued.**Subjects.****Instructors.**

Dynamics,
Strength of Materials,
Theory of Construction,
Machine Design,
Compound Stress,
Hydraulics,
Thermodynamics, and Theory of the
Steam Engine,
French.

J. Galbraith, M.A., LL.D., Professor.
J. McGowan, B.A., B.A.Sc., Lecturer.
R. W. Angus, B.A.Sc., Lecturer.
H. G. McVean, B.A.Sc.,
Demonstrator.

Statics,
Drawing,
Architecture,
Plumbing, Heating and Ventilation,
Mortars and Cements,
Brick and Stone Masonry.

C. H. C. Wright, B.A. Sc. Professor.
A. H. McBride, Grad. S.P.S., Fellow.
W. E. Wagner, B.A.Sc., Fellow.
W. C. Tennant, B.A.Sc., Fellow.

Surveying,
Geodesy and Astronomy,
Spherical Trigonometry,
Least Squares,
Descriptive Geometry.

L. B. Stewart, D. T. S., Professor.
E. V. Neelands, B.A. Sc., Fellow.

Electricity,
Magnetism,
Dynamo-Electric Machinery,
Theory of Mechanism,
Mechanics of Machinery,
Rigid Dynamics.

T. R. Rosebrugh, M. A., Professor.
H. W. Price, B.A.Sc., Demonstrator.
M. V. Sauer, B. A. Sc., Fellow.

Subjects Taught by the Faculty of the University.**Subjects.****Instructors.**

Algebra,
Euclid,
Plane Trigonometry,
Analytical Geometry,
Calculus,
Astronomy.

Alfred Baker, M.A., Professor.
A. T. DeLury, B.A., Associate Professor.
E. F. Burton, B.A., Fellow.

Sound,
Light, Heat,
Electricity and Magnetism,
Hydrostatics.

James Loudon, M.A., L.L. D., Professor.
W. J. Loudon, B.A., Associate Professor.
C. A. Chant, M.A., Lecturer.
J. C. McLennan, B.A., Ph. D.,
Associate Professor.
G. R. Anderson, M.A., Assistant,
J. S. Plaskett, M.A., Assistant.

Biology,
Mineralogy.

R. Ramsay Wright, M.A., Professor.
T. L. Walker, M.A., Ph. D., Professor

DRAWING.

Model drawing, machines and structures, map and topographical drawing, designs and estimates, graphical calculations.

Descriptive geometry, including practical geometry (plane and solid); orthographic, oblique and perspective projections; intersections of surfaces, shades and shadows, stone cutting, theory of mechanism, theory of mapping, etc.

Text Books and Books of Reference

Angel - Plane and Solid Geometry.

Binn—Orthographic Projection.

Church—Descriptive Geometry (*a*), (*b*).

Davidson—Projections.

Low—Machine Drawing and Design.

Millar—Descriptive Geometry.

MacCord—Lessons in Mechanical Drawing.

Reinhardt—Lettering for Draftsmen, Engineers and Students, (*b*), (*c*)

Vere Foster—Copy Book No. 10 (*a*).

Warren—Stone Cutting (*c*).

Worthen—Topographical Drawing.

SURVEYING AND LEVELLING.

LAND SURVEYING.

Chain surveys.

Compass and theodolite surveys.

Method of keeping field notes.

Determination of heights and distances.

Plotting.

LEVELLING.

Longitudinal and cross sections.

Plotting.

SETTING OUT.

Setting out straight lines and curves.

Setting out levels.

MENSURATION.

Lines, surfaces and solids.

Timber, masonry, iron and earthwork.

Capacity of Reservoirs, etc.

Lectures are also given on the distinctive features of Mining and Hydrographic Surveying.

Text Books.

- Brough—Mine Surveying (*b*), (*c*).
 Gillespie—Higher Surveying (*b*), (*c*), (*d*).
 Henck or Searle—Railway Curves (*b*), (*c*).
 Johnson—Theory and Practice of Surveying.
 Murray—Manual of Land Surveying (*a*).

PRACTICAL ASTRONOMY AND GEODESY.

ORDINARY COURSE.

The work included in this course is sufficient to fulfil the requirements of the final examination for Ontario and Dominion land surveyors.

In astronomy the principal subjects are the determination of time, latitude and azimuth, and the general principles of the method of determining longitude. Practical instruction is given in the methods of taking observations.

In geodesy all surveys, computations and methods of map construction are based upon supposition that earth is a sphere.

ADVANCED COURSE (FOURTH YEAR).

The work in this course is intended to fulfil the requirements of the final examinations for Dominion Topographical Surveyors. It is distinguished from the work of the ordinary course not so much by the subjects as by the degree of refinement to which the investigations are carried.

In geodesy the earth is considered as a spheroid.

Text-Books.

- Chauvenet—Spherical and Practical Astronomy.
 Doolittle—Practical Astronomy.
 Gillespie—Higher Surveying (*b*), (*c*), (*d*).
 Gore—Elements of Geodesy (*c*), (*d*).

First year text-books (*a*), Second year (*b*), third year (*c*), Fourth year (*d*).

SUBJECTS AND TEXT-BOOKS.

Green—Spherical and Practical Astronomy (*c*), (*d*).

Helmert—Höhere Geodäsie.

Nautical Almanac, 1902 (*c*), (*d*).

APPLIED MECHANICS.

STATICS.

The calculation of the stresses in framed structures, solid and riveted beams, arches, etc. Both graphical and analytical methods used.

THEORY OF THE STRENGTH AND ELASTICITY OF MATERIALS.

THEORY OF COMPOUND STRESS.

DESIGNING OF STRUCTURES in timber, iron and masonry—arches, retaining walls, roofs, bridges, etc.

DYNAMICS.

Representation and measurements of forces and motions.

Principles of work and energy.

Efficiency of machines. Friction.

Transmission of energy—belts, shafts, crank and connecting rod, etc.

Fly-wheels, governors.

Balancing of machinery, etc., etc.

STRENGTH OF THE PARTS OF MACHINES.

MACHINE DESIGN—

HYDRAULICS.

Discharge of water through orifices, notches, etc.

Flow in pipes and open channels. Sewerage, water-works, water-power, water-wheels, turbines, pumps, etc.

THERMODYNAMICS AND THEORY OF THE STEAM ENGINE.

Text-Books and Books of Reference.

Baker—Masonry Construction (*d*).

Billings—Heat and Ventilation.

Bodmer—Hydraulic Motors, Turbines, etc. (*d*).

Carnegie Pocket Companion.

- Carpenter—Heating and Ventilation of Buildings (*c*).
 “ Experimental Engineering (*a*).
 Du Bois—Graphic Statics.
 Strains in Frames Structures.
 Gerhardt—House Drainage and Sanitary Plumbing (*c*).
 Greene—Trusses and Arches.
 Innes—Centrifugal Pumps, Turbines and Water Motors (*d*).
 Johnson—Modern Framed Structures (*c*), (*d*).
 “ Materials of Construction (*d*).
 Kennedy—Mechanics of Machinery (*b*), (*c*).
 Kidder—Building Construction and Superintendence.
 “ Architect and Builders’ Pocket Book.
 Lanza—Applied Mechanics.
 Low and Bevis—Machine Drawing and Design (*b*), (*c*).
 Low—Machine Drawing (*a*), (*b*), (*c*).
 Merriman and Jacoby—Roofs and Bridges.
 Merriman—Mechanics of Materials (*b*), (*c*), (*d*).
 “ Hydraulics (*c*), (*d*).
 Patton—Foundation (*d*).
 Peabody—Thermodynamics (*d*).
 “ Steam Tables (*d*).
 Rafter and Baker—Sewage Disposal in the United States.
 Rankine—Applied Mechanics (*c*), (*d*).
 Reuleaux—The Constructor.
 Santo Crimp—Sewage Disposal Works.
 Shann—Elementary Treatise on Heat (*c*), (*d*).
 Trautwine—Engineer’s Pocket Book.
 Unwin—Elements of Machine Design (*c*).
 “ Testing of Materials of Construction.
 Von Ott—Graphic Statics (*a*).
 Williamson—Elasticity (*d*).

THEORY OF MECHANISM.

Principles of the transmission of motion without reference to force.

Pitch surfaces, spur wheels, bevel wheels, skew-bevel wheels, trains of wheelwork, teeth of wheels, cams, cranks, eccentrics, links, bands and pulleys, hydraulic connections, frictional gearing, link motion for slide valves, etc.

Text-Books and Books of Reference.

Auchincloss - Valve and Link Motions (*c*).

Goodeve - Elements of Mechanism (*b*).

Halsey—Side Valve Gears.

Kennedy—Mechanics of Machinery (*b*). (*c*).

Rankine - Machinery and Millwork.

Reuleaux - Kinematics of Machinery

ELECTRICITY.

Instruction is given in this subject by laboratory work in the laboratories both of the School and of the University of Toronto, as well as by courses of lectures partly in the School and partly in the University.

The work comprises—

ELEMENTARY ELECTRICITY AND MAGNETISM.

MEASURING INSTRUMENTS—

Theory and uses in determining current, electromotive force, resistance of metallic and electrolytic conductors, capacity, magnetic flux, inductance, coefficient of mutual induction, etc., etc.

MATHEMATICAL THEORY OF ELECTRICITY.

APPLICATIONS OF ELECTRICITY—

Laboratory work and lectures on telegraph, telephone, dynamos, electric lighting; arc and incandescent systems, storage batteries, transmission of power by electricity, etc.

THEORY OF ALTERNATING CURRENT GENERATORS AND TRANSFORMERS.

Text-Books and Books of Reference.

Bedell & Crehore—Alternating Currents.

Carhart & Patterson—Electrical Measurements (*b*), (*d*).

Bedell—Principles of the Transformer (*d*).

Fleming—Alternate Current Transformers, Vols. I and II (*d*).

Jackson—Electromagnetism and the Construction of Dynamos (*c*).

Kempe—Electrical Testing (*b*)

Loudon & McLennan—Practical Physics (*b*)

Stewart & Gee—Practical Physics.

Thompson, S. P.—Elementary Electricity and Magnetism.

“ —Dynamo Electric Machinery.

“ —Polyphase Currents.

Wiener—Dynamo Electric Machines.

ARCHITECTURE.

HISTORY OF ARCHITECTURE --

Egyptian, Assyrian and Persian.

Classic.

Romanesque and Byzantine.

Gothic.

Renaissance.

ORDERS OF ARCHITECTURE.

HISTORY OF ORNAMENT.

PRINCIPLES OF DECORATION.

Text-Books and Books of Reference.

Fergusson—History of Architecture.

Fletcher—A History of Architecture.

Gwilt—Encyclopædia of Architecture.

Leeds—Orders of Architecture (*b*).

Osborne—Art of House Planning (*d*)

Owen Jones—Grammar of Ornament.

Racinet—L'Ornament Polychrome.

Rickman—Gothic Architecture.

Sharpe—Seven periods of Church Architecture.

Smith, T. Roger—Classic and Early Christian Architecture (*a*), (*b*).

Smith, T. Roger—Gothic and Renaissance (*c*).

Stratham—Architecture for General Readers.

Sturgis—European Architecture.

Vignole—The Five Orders of Architecture (*b*), (*c*).

MATHEMATICS AND PHYSICS.

The pure Mathematics included in this course is taught in the University of Toronto.

The Applied Mathematics is taught partly in the University and partly in the school.

First year text-books (*a*), Second year (*b*), Third year (*c*), Fourth year (*d*).

Text Books and Books of Reference.

- Ganot—Physics (*b*).
 Hall & Knight—Plane Trigonometry (*a*).
 Loomis—Calculus (*b*).
 Loudon & McLennan—Practical Physics (*b*).
 Mackay—Elements of Euclid (*a*).
 Newcombe & Holden—Astronomy (*b*).
 Osborne—Calculus.
 C. Smith—Conic Sections (*a*).
 Hamblin Smith—Hydrostatics (*b*).
 Balfour Stewart—Heat.
 Todhunter—Algebra (*a*).
 “ —Spherical Trigonometry (*b*).
 Tyndall—Sound.

CHEMISTRY.**COURSES IN THE SCHOOL OF PRACTICAL SCIENCE.**

Elementary chemistry.

Applied chemistry.

The chemistry of combustion, fuels, furnaces, artificial lighting, explosives, photography, building materials, water, air, sewage, chemical manufactures.

Laboratory work, including technical analysis, the analysis of food, water and air, and toxicology.

COURSES IN THE UNIVERSITY OF TORONTO.

Organic Chemistry.

Chemical theory.

Physical chemistry.

Text Books and Books of Reference.

- Allen—Commercial Organic Analysis.
 Arnold—Steel Works Analysis.
 Beilstein—Organic Chemistry.
 Beringer—Text Book of Assaying.
 Blair—Chemical Analysis of Iron and Steel.
 Blount—Electro-Chemistry.
 Bloxam—Chemistry.

First year text-books (*a*), Second year (*b*), Third year (*c*), Fourth year (*d*).

- Bloxam & Blount—Chemistry for Engineers and Manufacturers.
 Blyth, A. W.—Poisons.
 “ —Foods.
 Bolley—Handbuch der Chemischen Technologie.
 Dammer—Handbuch der Anorganischen Chemie.
 Douglas and Johnston—Qualitative Analysis.
 Fresenius—Qualitative and Quantitative Analysis.
 Furman—Manual of Practical Assaying.
 Hempel—Gas Analysis.
 Hollemann—Inorganic Chemistry.
 Jones—Practical Chemistry.
 Lord—Notes on Metallurgical Analysis.
 Lunge—Sulphuric Acid and Alkali.
 “ —Coal Tar and Ammonia.
 Meyer—History of Chemistry.
 Morgan—Elements of Physical Chemistry.
 Newth—Manual of Chemical Analysis.
 Ostwald—Lehrbuch der Allgemeinen Chemie.
 “ —Outlines of General Chemistry.
 “ —Principles of Inorganic Chemistry.
 Pattison Muir—Thermo-chemistry, elements of.
 Poole—Calorific value of Fuels.
 Post—Chemisch-technische Analyse.
 Remsen—Inorganic and Organic Chemistry.
 Richter—Inorganic and Organic Chemistry.
 Roscoe & Schorlemmer—Treatise on Chemistry.
 Sadtler—Organic and Applied Chemistry.
 Sutton—Volumetric Analysis.
 Thorp—Outlines of Industrial Chemistry.
 Thorpe—Dictionary of Applied Chemistry.
 Thorpe—Quantitative Analysis.
 Wagner—Chemical Technology.
 Walke—Lectures on Explosives.
 Watt—Dictionary of Chemistry.
 Wiechman—Sugar Analysis.
 Winkler—Gas Analysis.

MINERALOGY, GEOLOGY AND METALLURGY.

1. Mineralogy and Geology.

Mineralogy and crystallography.

Geology and palæontology.

Petrography.

Physical geography.

Blowpipe Analysis.

Determinative mineralogy.

2. Mining and Metallurgy.

Mining Geology.

Ore dressing.

Metallurgy of iron and steel.

Metallurgy of nickel, copper, silver, etc.

Assaying.

Milling.

Text Books and Books of Reference.

Chapman or Brush—Mineral Tables.

Chapman—Mineralogy and Geology of Canada.

Crosby—Determination of Minerals.

Dana—Manual of Geology.

Furman—Assaying.

Geikie—Text-Books of Geology.

Harker—Petrography.

Howe—Metallurgy of Steel.

Ihlseng—Manual of Mining.

Kemp—Handbook of Rocks.

Kemp—Ore Deposits of the United States.

Kuhnhardt—Ore Dressing.

Nicholson—Palæontology.

Peters—Modern Copper Smelting.

Phillips—Ore Deposits.

Phillips and Bauerman—Elements of Metallurgy.

Plattner—Manual of Blowpipe Analysis.

Roberts-Austen—Metallurgy.

Rose—Metallurgy of Gold.

Rosenbusch—Petrography.

STEAM ENGINE LABORATORY.

The equipment of this department is as follows :

A Babcock & Wilcox 52 h.p. boiler.

A Harrison-Wharton 12 h.p. boiler.

A 50 h.p. Brown engine. This engine was constructed specially for experimental investigations. It is steam jacketted and has three alternative exhausts, to the open air, to a jet condenser, and to a Wheeler surface condenser, the latter of which was kindly presented to the school by Mr. F. M. Wheeler, of New York, the inventor.

There are also a Blake circulating pump, a Knowles air pump and a Blake feed pump, the latter of which was a gift from the manufacturers. In addition there are the usual measuring instruments, indicators, gauges, gauge testing apparatus, scales, brakes, dynamometers, anemometers, thermometers, a platinum and platino-rhodium thermo-couple, etc., etc.

HYDRAULIC LABORATORY.

This laboratory contains two large steel tanks arranged for the experimental study of the flow of water through orifices and over weirs. Both orifices and weirs may be conveniently changed.

The discharge is measured by two tanks which are filled and emptied alternately by means of four valves operated by a single lever, thus enabling the measuring to be continued for any length of time without interrupting the flow.

The water is supplied by a three-throw pump with double acting cylinders, having a capacity of 500,000 gallons per 24 hours.

For the work on turbines etc., a six-inch new American turbine, the gift of the firm of William Kennedy & Sons, Owen Sound, has been set up so that efficiency determinations under different gate openings and heads may be made. In addition to this there is a thirty-six inch axial impulse turbine, and a Pelton wheel, each being provided with suitable brakes, means of accurately measuring the discharge continuously, and other requirements for experimental work. There are also two centrifugal pumps, one made by the Morris

Machine Works, the other having been kindly presented to the school by The Northey Co., Limited, Toronto, the manufacturers. A dynamometer and other necessary apparatus are provided for adapting these pumps to scientific investigations.

A Venturi meter has also been installed, and apparatus has been arranged so that the discharge from different forms of nozzles, and the frictional losses in elbows, valves, etc., may be determined.

There are the usual measuring instruments, gauges, guage-testing apparatus, scales, brakes and dynamometers, and a nine-inch McCormick turbine.

STRENGTH OF MATERIALS LABORATORY.

The machines in this department are the following :

An Emery 50-ton machine, built by William Sellers & Co., of Philadelphia, for making tests in tension and compression.

A Riehle 100-ton machine for making tests in tension, compression, shearing and cross-breaking. It will take in posts twelve feet long and beams up to eighteen feet in length.

A Riehle 10-ton universal testing machine.

An Olson torsion machine for testing the strength and elasticity of shafting. This machine will twist shafts up to sixteen feet in length and two inches in diameter.

A Riehle transverse testing machine of 5,000 pounds capacity adapted to specimens up to 48 inches in length.

A Riehle abrasion machine, for testing the resistance to attrition of stones, brick, etc.

Extensometers of the Bauschinger, Unwin, Marshall and other types besides a large number of micrometers and scales.

The shop is equipped with a number of high-class machine tools specially fitted for reducing the specimens to the requisite shapes and dimensions with a minimum of hand labor. It is also supplied with the necessary appliances for making ordinary repairs and for making special apparatus for original investigation.

CEMENT TESTING LABORATORY.

This department is fitted with all the usual molds, gravimeters, tables and tank accommodation necessary in a well equipped laboratory.

In this laboratory there are also the following :

A Riehle 2,000-pounds machine, fitted for either tension or compression.

A Riehle 600-pounds machine fitted for tension only.

An extra large Faija's hot bath apparatus.

METROLOGICAL LABORATORY.

In the geodetic and astronomical department are a 100-foot and a 66-foot standard of length ; a 10-foot Rogers comparator with a graduating attachment ; a Kater's pendulum with vacuum chamber ; a Howard astronomical clock and electro-chronograph ; a sidereal chronometer, a Troughton & Simms 10-inch theodolite, eight surveyor's transits, seven levels, compasses, sextants, plane tables, micrometers, planimeters, etc. ; and all the necessary field instruments.

ELECTRICAL LABORATORY.

In one section of this laboratory a 20 kilowatt Edison motor furnishes power to drive several continuous current dynamos, series, shunt and compound wound, bipolar and multipolar, a Westinghouse experimental alternator, and a rotary converter when used as a polyphase dynamo. Of direct current motors, besides the one already mentioned, there are a Crocker-Wheeler machine and a 6 h.p. Edison motor, used in the mill-room, but available for testing ; besides fan motors. Of alternating current motors there are a General Electric three-phase induction motor and a single-phase induction motor with condensor compensator, besides a special experimental polyphase induction motor of $7\frac{1}{2}$ h.p., by the same company, in which the rotor terminals are all separately accessible. A revolving field for the latter machine makes it a general form of polyphase generator. There are also a Wagner single phase induction motor and a G. E. constant current transformer with a series of six arc lamps. Other types are represented by fan motors. A marble switchboard in this room facilitates connection between different circuits, both locally and for other parts of the building. It is supplied with 110 and 220 volts, direct current, and the same voltage of alternating current of 60 cycles from the city circuits, in addition to the range of

supply that may be had from our own generators and storage cells. Four switches which may be connected in any of the circuits, two sets of bus-bars for paralleling, automatic circuit breakers, arc and incandescent lamp circuits; and controlling rheostats are also connected to the switchboard.

Another section is the galvanometer room, in which are ten masonry piers to support instruments in such a way as to be free of vibration.

An adjoining room is the laboratory for advanced work, in which may be mentioned a Kelvin Balance and its rheostat, and an enclosure within which experiments with high voltages may be safely performed. Marble switch boards are placed in this room, and in the galvanometer room to connect with "Chloride" storage batteries of large and small cells located on a gallery in a separate room, and apparatus for convenience in standardizing measuring instruments is available.

Among the instruments and apparatus may be mentioned. Numerous D'Arsonval galvanometers of Carpentier, Rowland and other designs, ballistic galvanometers, a Thomson galvanometer, telescopes and scales, divided microfarad condenser, Kempe discharge key, rheostats and proportional arms for Wheatstone bridge and other purposes, slide wire metre bridges, including special bridge for electrolytic resistance; standard resistances, including megohm, 10 ohms, several copies of the ohm, divided ohm, and a complete set of standards from one hundred thousand ohms down to one thousandth ohm, certified by the Charlottenburg Reichsanstalt, the latter with oil bath and stirrer; Willyoung potentiometer, standard cells, Clark and Helmholtz, Kohlrausch tubes for measurement of electrolytic resistance, Lippmann electrometers, Kelvin-Mascart electrometer, Nernst electrometer. Besides these are numerous Weston instruments including wattmeters, voltmeters for direct and alternating current, ammeters, and milammeters, Thomson and Whitney ammeters and voltmeters, three Siemens electrodynometers, Kelvin balance, Kelvin high potential electrostatic voltmeter, and electrostatic multicellular voltmeter; Thomson recording wattmeters (including one for three phase), Shallenberger recording ammeter; lightning arresters, Westinghouse, Stanley, Wagner and Thomson-Houston transform-

ers ; a General Electric 10,000 volt testing transformer, and a low voltage 1,000 ampere transformer, high potential condenser, Wimshurst influence machine, Ruhmkorff coils, Crookes' tubes, fluoroscope, Braun tube wireless telegraph apparatus ; Hopkinson permeameter for testing the magnetic qualities of iron, instruments for measuring instantaneous current and voltage in alternating current circuits according to Duncan, Fessenden contact maker, earth inductor, Ayrton and Perry secohmmeter, fixed and variable standards of inductance, double sets of telegraph and telephone apparatus ; Lummer-Brodhun and Bunsen photometers with accessories for arc and incandescent light photometry and Hefner standard amyl-acetate lamp. Voltameters of all the usual forms, balances, thermometers, portable rheostats and numerous minor appliances complete this portion of the equipment. Among arc lights may be mentioned the Manhattan, Upton, Adams-Bagnall, Toerring, Thomson, Safford and United Electric long burning enclosed arcs, Thomson and other lamps for alternating current, the Ward and Universal (two in series of 110 volt circuits). Thomson-Houston and Ball for series circuits and one the gift of W. A. Turbayne.

MINERALOGICAL LABORATORY.

This laboratory contains a collection of hand specimens of minerals and rocks for the purpose of training students in handling and becoming familiar with the more common varieties of both ; it is also provided with balances for determining the specific gravity of minerals.

Blow pipe instruction is given here, there being seating room, blow pipe burners and accommodation for thirty-six students working at once.

ASSAYING LABORATORY.

This laboratory is equipped with three gas crucible furnaces, three gas muffle furnaces, two Brown coke furnaces for crucibles and muffles, two pulverizers, a muller, and all other necessary appliances for pulverizing and preparing ores for fire assay. The pulp balances for weighing charges and the delicate balances for weighing gold and silver buttons are kept

in a room opening off the assay laboratory. Adjoining the assay laboratory is a room with a lathe for preparing rock sections for examination under the microscope ; also the necessary appliances for making rock sections by hand. Six petrographical microscopes are reserved for the use of advanced students in lithology.

MILL ROOM.

This room contains a Dodge crusher, a Tulloch ore feeder, a Fraser and Chalmers three-stamp mill, with amalgamated silver copper plates, and a Frue Vanner. The concrete floor of the mill-room provides ample space for sampling lots of ore of one or two tons. The machinery is driven by an 8-horse power Edison motor, which is supplied with current from the city circuit. The mill-room is also provided with settling tanks for the tailings and concentrates, a pair of Hamilton rolls for dry crushing, and an automatic sampler.

With this plant a complete mill test can be made of a ton or more of ordinary mill ore, thus affording an opportunity to those desiring it, of having a test made under conditions similar to those of actual practice, and upon a larger scale than that of an assay of a few pounds.

The mill-room affords the student an excellent opportunity of studying milling, as all the machines in use are of the same construction as those employed in the best large mills.

Two other rooms have been fitted up with a large brick assay furnace and a reverberatory furnace for roasting sulphide and arsenical ores ; leaching vats for treating ores by the cyanide process, and a chlorination barrel.

CHEMICAL LABORATORIES.

The Qualitative Laboratory affords accommodation for about forty students working at one time. The working tables are supplied with water and gas, and there is a fume cupboard within easy reach of each. A complete set of apparatus is supplied to each student on payment of the deposit prescribed.

The Quantitative Laboratory will accommodate about 20 students. It is furnished with convenient work tables, and fume cupboards, and supplied with the most recent apparatus

for gravimetric, volumetric and gasometric analysis, both scientific and technical. Besides balances by the best makers, and of the most recent construction, furnaces for fusion, organic analysis, etc., and all the requisites for the assays of ores, furnace and other technical products in the wet way, the apparatus includes an experimental vacuum pan, a filter press, the latest forms of Fischer's, Mahler's, Junker's and Carpenter's apparatus for the determination of the heating power of fuel, facilities for the electrolytic determination of metals, including a Gulcher thermo-electric pile; spectroscopes, polarscopes and microscopes, and, in short, all the apparatus required for a thorough course in analytical chemistry and assaying.

In addition there is also a laboratory for gas analysis and calorimetric work.

PHYSICAL LABORATORY.

University of Toronto.

The physical laboratory in connection with the University of Toronto is furnished with a large collection of apparatus for lecture experiments in the departments of mechanics, sound, light, heat and electricity. It is also well supplied with instruments of precision for individual work in the same departments. In addition to an elementary laboratory, there are several special laboratories which offer unusual facilities for the conduct of experiments in the various branches of physics.

The electrical apparatus includes electrometers, galvanometers, resistance coils and bridges, testing keys, batteries, electrical machines Holz and Carre, Ruhmkorff coils, Crookes' tubes, telephones, etc.

MUSEUMS.

The Geological Museum includes collections of minerals, rocks, and fossils. There is a large general collection of minerals classified in the usual manner, and intended for comparison and reference in advanced classes; but special attention is paid to the extensive collection of Ontario minerals, which, with few exceptions, contains all the species known in the Province, and is particularly rich in examples of economic minerals. The Ontario collection is constantly being added to and is believed to be as complete as any in the Dominion.

Adjoining the mineral collection is a series of ores of all descriptions. Particular prominence is given to the gold and silver ores of Canada, especially the Ontario gold ores.

The rocks also are arranged in two collections, one a large general collection from foreign localities, containing massive schistose and sedimentary rocks; the other, a set of Canadian rocks, especially complete in typical country rocks from important ore deposits. An extensive set of thin sections enables advanced students to study both rock collections microscopically.

The palæontological collection consists of fossils and casts, including the chief typical forms needed for determining the age of sedimentary rocks.

A number of wall cases have been prepared for a collection of specimens illustrating industrial chemistry, and a beginning made toward arranging the materials on hand.

In a separate room there is an interesting collection of dressed building and ornamental stones from various parts of Ontario, serving as illustrations in the architectural department.

LIBRARY.

The library is supplied with a number of the more important scientific and technical periodicals. A valuable collection of works of reference in the subjects of study pursued in the school has been formed and is being added to year by year.

LIST OF DONORS TO THE LIBRARY.

American Society of Civil Engineers—Proceedings.

Association of Engineering Societies—Journal.

Blackwood, A. E.—Stone.

Bureau of Mines—Report.

Canadian Mining Institute—Journal.

Columbia University—Quarterly.

Department of Mines, Nova Scotia—Report.

Geological Survey of Canada—Report.

Gzowski, Estate of the late Sir Casimir—

Transactions of American Society of Civil Engineers, 1874-1898.

Transactions of Canadian Society of Civil Engineers, vol. I., 1887—vol. XII., 1898.

Proceedings of The Institution of Civil Engineers, vol. LXIII., 1880—vol. CXXXII., 1898.

Institution of Engineers and Shipbuilders in Scotland—Transactions.

Institution of Junior Engineers—Transactions.

Institution of Mechanical Engineers—Proceedings.

Royal Institute of British Architects—Journal and Proceedings.

Society of Chemical Industry—Journal.

Société des Ingénieurs Civils de France—Mèmoires.

United States Coast and Geodetic Survey—Report.

United States Government Tests of Metals, etc.—Report.

University of Toronto—Studies.

THE ENGINEERING SOCIETY OF THE SCHOOL OF PRACTICAL SCIENCE.

Officers for 1903-1904.

President	J. F. Hamilton.
Vice-President	J. J. O'Sullivan.
Recording Secretary	W. E. Wickett.
Treasurer	J. M. Wilson.
Corresponding Secretary	P. M. Sauder.
Editor	To be appointed.
Librarian	P. C. Coates.
Assistant Librarian	J. P. Charlebois.
Graduates' Representative	J. F. S. Madden.
Fourth Year do	J. A. McFarlane.
Third Year do	H. L. Chilver.
Second Year do	C. E. Sisson.
First Year do	To be elected.

The Society meets every second Tuesday during the Academic Year. Papers are read, and discussions are held on engineer-subjects. The Society publishes a pamphlet annually, containing the best papers read at the meetings.

LODGING AND BOARD.

Accommodation is readily obtainable in numerous private boarding-houses within convenient distance of the School, at a cost of from three dollars upwards for comfortable lodging with board; or rooms may be rented at a cost of from one dollar per

week upwards, and board obtained separately at moderate rates. A list of accredited boarding houses is kept by the Secretary of the University College Young Men's Christian Association, and students are recommended to consult him with reference to the selection of suitable accommodation.

GYMNASIUM AND ATHLETIC GROUNDS.

(From the Calendar of the University of Toronto.)

“The University Gymnasium was completed and equipped in 1893. It is fully provided with the best and most modern appliances for physical culture, and contains a running track, shower baths and swimming bath, besides the necessary dressing rooms and other conveniences. A competent instructor in gymnastics is in constant attendance to superintend and direct the exercises of students. In addition to the lawn in front of the Main University Building and a campus in the rear, a large plot of ground on Devonshire Place has been set apart as an athletic field. By this addition the facilities for football, cricket, tennis and other out-door athletic sports are doubled, as compared with previous accommodation; and by these grounds, in conjunction with the gymnasium, ample opportunity is afforded to all students for healthful exercise and physical development. To assist in meeting the expenses of the gymnasium, a nominal annual fee is imposed on those who avail themselves of its advantages. The supervision of all athletic matters has been intrusted by the Councils to an Athletic Board, consisting of six members appointed from the Faculty and the officers of the Athletic Association. All applications of clubs for the use of grounds must be made annually to this Board. All such applications must be accompanied by a list of officers. In the case of new clubs the list of officers must be accompanied by particulars as to the organization and objects of the club making application.

UNIVERSITY OF TORONTO ATHLETIC ASSOCIATION.

DIRECTORATE.

(From the Calendar of the University of Toronto.)

Pres.—President Loudon, L.L. D.

Vice-Pres.—W. B. Hendry, B. A.

Sec.-Treas.—W. G. Wood.

Dir. — Professor McCurdy.

Dir. — Rev. D. B. Macdonald.

“ J. H. Chown,

“ W. Elwell.

“ S. P. Biggs,

“ Prof. C. H. C. Wright,

The athletic association is now the paramount body in University Athletics, and has entire jurisdiction over the athletic clubs using the University name, and over their finances, members, and policy, subject to the University authorities. Henceforth no financial agreement can be entered into by any such club without the sanction of the Directorate. No expenditure of any kind in connection with any such club can be made without the written order of the Secretary-Treasurer of the Directorate.

STUDENTS' UNION BUILDING.

(From the Calendar of the University of Toronto.)

“ In 1894, additions were made to the front of the building in which the Gymnasium is situated, consisting of a large hall for public meetings, a reading room and committee rooms. This additional accommodation is available for the work of the various student societies and for academic purposes. Applications for the use of rooms, accompanied by a list of officers and a copy of the constitution of the society making application, must be made, through the President, to the joint committee of the Councils on Gymnasium and Students' Union Building, at the beginning of the season, or from time to time as occasion requires. Arrangements have also been made by which recognized societies may obtain the use of committee-rooms on application to the janitor of the Students Union Building.

SCHOOL OF PRACTICAL SCIENCE ATHLETIC ASSOCIATION.

Executive Committee 1903-04.

Honorary President.....J. McGowan, B. A.

President.....W. H. Young.

Vice-President.....R. A. Bryce.

Secretary-Treasurer....W. R. Worthington.

IV. Year Representative.....B. B. Patten.

III. “ “F. Burnham.

II. “ “F. F. Dowling.

I. “ “To be elected.

The athletic association is the ruling body in School athletics and has full control over all athletic clubs using the School name. The Executive Committee has power to suspend any one from the privileges of membership in the association for any breach of its regulations and controls the finances of all athletic clubs in the School. The annual membership fee of this association is fifty cents.

No other monies are collected for the support of athletics in the school without the sanction of the Executive Committee.

RUGBY FOOTBALL.

The Mulock Cup, which was presented by the Hon. Wm. Mulock, M. A., LL. D., to the University of Toronto Rugby Foot-ball Club for inter-college competition, brings out each year a large number of contestants from the University and affiliated colleges.

Rugby Football Club of the School of Practical Science.

OFFICERS.

Hon. President.....	Principal Galbraith.
President.....	A. E. Gibson.
Sec.-Treas.....	H. F. White.
Manager of senior team.....	J. Smith.
Captain of senior team.....	R. A. Bryce.
Manager of junior team.....	H. W. Evans.
Captain of junior team.....	H. B. Housser.

LIST OF PLAYERS.

SENIOR TEAM.

Alison, J. G. R.	Lang, A. G.
Bryce, R. A. (Capt.)	Robinson, L
Bonnell, M. B.	Rutherford, F. N.
Burnham, F.	Sauder, P. M.
Burwash, N. A.	Small, H. S.
Coulson, C. L.	Smith, J. H. (Mgr)
Clarke, F. F.	White, H. F.
Ingles, J.	

JUNIOR TEAM.

Winners of Mulock Cup.

Alport, F.	Housser, H. B. (Capt.)
Baldwin, F. W.	McGiverin, F. A.
Bevan, W. H.	Montague, F. F.
Dill, A. W.	Morden, L. W.
Fletcher, H. M.	Power, C. W.
Fletcher, W.	Racey, G. W.
Ford, E. A.	Reynolds, G. B.

ASSOCIATION FOOTBALL.

In order to encourage Association Football on the College Campus, the Faculty of the University of Toronto presented a cup, known as the Faculty Cup, to the Inter-College Association Football Club for annual competition among the University and affiliated colleges.

Association Football Club of the School of Practical Science.

OFFICERS.

Hon. President	Prof. L. B. Stewart, D.T.S.
League President	B. B. Patten.
President.....	W. P. Brereton.
Sec.-Treas.....	W. S. H. Keefe.
Manager Seniors.....	M. L. Miller.
“ Juniors	C. G. Williams.

LIST OF SENIOR PLAYERS.

Winners of Faculty Cup.

Brereton, W. P.	Oliver, J. P.
Depew, H. H.	Patten, B. B.
Dowling, F. F.	Rutherford, F. N. (Capt.)
Gibson, A. E.	Small, H. S.
Heron, J. B.	Williams, C. G.
McDonald, L. C.	Whelihan, J. A.
MacInnes, J.	Young, W. H.

LIST OF JUNIOR PLAYERS.

Winners of Junior Series.

Cavanagh, T. L.	McAuslan, H. J.
Connor, H. V.	Miller, H. M.
Dillabough, G. A.	Moore, E. E.
Jackson, E. R.	Pace, J. D.
Keefe, W. S. H.	Paterson, G. W.
MacKenzie, W. D.	Williams, C. G.
MacInnes, J.	

HOCKEY.

The trophy which is competed for annually among the Colleges in Hockey is known as the Jennings Cup, and is the gift of W. T. Jennings, Mem., Inst. C. E., Consulting Engineer, Toronto.

Hockey Club of the School of Practical Science.

OFFICERS.

Hon. President	Dr. Ellis.
President.....	A. G. Lang.
Vice-President	C. L. Coulson.
Sec. and Treas.....	R. H. Montgomery.
Manager Senior Team.....	D. H. Philp.
Manager Junior Team	H. M. Fletcher.

LIST OF PLAYERS.

SENIOR TEAM.

Barrett, J. H.	Montgomery, R. H.
Harris, C. J.	Nevitt, I. H.
Jackson, E. R.	Pace, G.

JUNIOR TEAM.

Winners of Jennings Cup.

Broadfoot, F. C.	Ford, E. A. (Capt.)
Cavanagh, T. L.	Housser, H. B.
Dillabough, G. A.	Montague, F. F.
Evans, H. W.	Pattee, L. F.
Fletcher, W.	Stewart, D. L. N.

THE TORONTO ENGINEER COMPANY.

Major commanding.....W. R. Lang, Professor of Chemistry
University of Toronto.

LieutH. W. Evans.

LieutS. P. Briggs.

Company Sgt. Major...H. N. Gzowski.

Sgt. Inst. Military Eng..W. B. Porte.

Sgt.....W. Elwell.

Lance Sgt.....A. C. Snively.

Sgt. Sgt.....H. D. Robertson.

Lance Sgt. SgtN. A. Burwash.

Signal.....W. E. Cane.

Quarter Master SgtA. Williams.

TRACK CLUB.

President.....J. A. Beatty.

Vice-Pres.....A. Gray.

Secy.-Treas.....H. B. Housser.

IV. Year Rep.....C. M. Teasdale.

III. " "J. H. Smith.

II. " "R. S. Smart.

I. " "F. A. McGiverin.

SESSION 1902-1903.

STUDENTS IN ATTENDANCE.

FIRST YEAR.

Regular Students.

1	Alport, F.	Orillia.
3	Armour, R. H.	Lindsay.
3	Aylsworth, B.	London.
2	Barber, W.	Toronto.
5	Bates, H. S.	Merrickville.
3	Bell, G. G.	Chesley.
3	Bertram, T. S.	Dundas.
3	Blaine, T. R.	Barrie.
3	Bristol, W. M.	Madoc.
3	Carson, W. R.	Carsonby.
3	Chantrell, E.	New Westminster.
3	Charlebois, J. P.	Toronto.
3	Clement, S. R. A.	Innisfil, Tp.
5	Coleman, R. M.	Toronto.
1	Connery, F.	Toronto.
3	Coone, S. E.	Manilla.
1	Crane, G. A.	Toronto.
1	Crosby, N. L.	Hebron, N. B.
3	Crysdale, C. R.	Northport.
3	Dillabough, G. A.	Morrisburg.
3	Dowling, F. F.	Harriston.
4	Downey, F. C.	Toronto.
5	Drewry, W. S.	Winnipeg, Man.
3	Fierheller, H. S.	Markham.
3	Fletcher, H. M.	Hamilton.
3	Gordon, J. M.	Toronto.
1	Greene, W. H.	Toronto.
3	Harrington, G. E.	Brantford.
3	Harrison, F. W.	Hagersville.
1	Hendry, M. C.	Toronto.
1	Henry, E. A.	Kincardine.
2	Hertzberg, C. S. L.	W. Toronto Junction.

FIRST YEAR—*Continued.*

1	Hett, S	Sutton West.
3	Hewson, W. G	Niagara Falls.
1	Holmes, O. B.	Selkirk.
3	Howard, J. A	Springvale.
3	Jepson, W. C.	Niagara Falls.
1	Jones, G. S.	Smith's Falls.
3	Jones, W. C	Port Hope.
1	Jupp, A. E.	Toronto.
3	Kribs, G	Hespeler.
1	Latornell, A	Meaford.
3	Leighton, J. W.	Toronto
1	MacInnes, J	Ripley.
3	MacKenzie, W. D	Kirkfield.
3	MacKinnon, W	Fenelon Falls.
2	McGiverin, F. A.	Hamilton.
3	McGorman, E. S.	St. Mary's.
1	McGregor, W. W.	Glen Williams.
2	McKenzie, D. W.	Lochash.
3	McLean, C. A.	Frome.
2	McLean, W. N.	Erin, T'p.
3	Maguire, H. C.	St. Catharines.
3	Miller, L. R.	Orillia.
3	Miller, H. M	St. Catharines.
3	Moffatt, R. W.	Bagnor.
1	Montague, F. F.	Hamilton.
1	Moore, W. J	North Gower.
3	Morden, L. W.	Hamilton.
3	Munro, G. R.	Peterboro.
3	Nicklin, W. G.	Sarnia.
3	Paterson, G. W.	Belton.
3	Pattee, L. F.	Trenton.
3	Pettingill, R. E.	Rose Hall.
3	Phillips, H. E.	Winnipeg.
6	Power, C. W.	Toronto.
1	Quick, H. E.	Toronto.
1	Rayner, G. W	Thorold.
3	Reynolds, G. B.	Toronto.

FIRST YEAR—*Continued.*

3	Richardson, W. L.....	Walkerton.
1	Ross, G. W.....	Burford.
5	Rothwell, T. E.....	Gilford.
2	Scott, G. S.....	Toronto.
3	Simpson, A.....	Galt.
3	Sisson, C E.....	Peterboro.
1	Smith, F. R. S., B.A.....	Ingersoll.
3	Snider, L. E.....	Deseronto.
1	Steele, D. L.....	Meaford.
1	Stevens, W. H.....	Lindsay.
1	Stewart, D. L. N.....	Ottawa.
3	Stubbs, W. F.....	Lakefield.
1	Sturdy, N. H.....	Buffalo, N.Y.
1	Swan, W. G.....	Kincardine.
3	Tate, N. S.....	Cavan, T'p.
3	Thomson, L. R.....	Toronto.
2	Thomson, J. E.....	Toronto.
1	Traill, J. J.....	Toronto.
3	Turner, W. E.....	Orangeville.
3	Uren, A. E.....	Ingersoll.
1	Wagner, H. L.....	Toronto.
1	Wallace, W. W.....	North Gower.
1	Webster, W. G.....	Oakwood.
1	Wheeler, J. S.....	Kirkfield.
3	Wilkie, J. H. N.....	Toronto.
1	Wilson, J. M.....	Toronto.

Non-Regular Students Taking Full Course.

3	Ainlay, W. L.....	Brussels.
3	Anderson, S. S.....	Windsor.
3	Arens, H. W.....	Orilla.
3	Arnott, G. C.....	Toronto.
3	Baldwin, F. W.....	Toronto.
1	Bevan, W. H. B.....	Niagara Falls.
3	Bird, A. W.....	Putnam.
3	Bourke, E. W.....	Kingston, Jamaica.
3	Brady, W. S.....	Toronto.

FIRST YEAR—*Concluded.*

2	Broadfoot, F. C	Seaforth.
3	Cavanagh, T. L.	Moosomin, Assa.
2	Cochrane, W. C	Toronto.
3	Dill, A. W	Toronto.
2	Evans, H. W.	Toronto.
1	Ferguson, G. H.	Toronto.
2	Fletcher, W.	St. Catharines.
3	Ford, E. A	Belleville.
3	Greene, E. A.	Orillia.
2	Horwood, H. O. R.	Toronto.
3	Housser, H. B.	Toronto.
1	Hughes, E. V.	Newmarket.
2	Lewis, R. G	Balmy Beach.
1	Loudon, T. R.	Toronto.
3	MacKenzie, K. B	Sarnia.
3	McCurdy, J. A. D	Toronto.
2	McDonald, L. C.	Walton.
1	McGregor, J. M.	Ridgetown.
3	Mace, T. H.	Toronto.
3	Martin, H	Toronto.
2	Merritt, R. N	Toronto.
3	Pennington, C. H.	London.
3	Racey, G. W.	Comber.
1	Roddick, J. O.	Brantford.
1	Ross, C	Port Robinson.
3	Rundle, L. P	Goderich.
3	Ryerson, G. C	Toronto.
3	Schell, F. S.	Brantford.
3	Serson, H. V	Antrim.
3	Shirriff, C. H.	Niagara Falls, S.
3	Sibley, J	Toronto.
3	Thompson, H. L.	Hamilton.
3	Tillson, E. D.	Tilsonburg.
3	Turner, G. M	Victoria, B.C.
3	Vaughan, J. M.	Toronto.
5	Wickett, W. E.	Toronto.
2	Wills, P. H.	Belleville.
2	Wright, G. W	Toronto.

SECOND YEAR.

2	Allen, C. W	Toronto.
3	Barrett, J. H	Port Hope.
1	Beatty, H. E	Toronto.
2	Begg, W. A	West Flamboro.
1	Boeckh, J. C	Toronto.
3	Bonnell, M. B	Bobcaygeon.
3	Brown, T. D	Barrie.
2	Bryce, R. A	Toronto.
3	Burley, R. J	Regina, Assa.
3	Burnham, F. W	Ashburnham
3	Calder, J. W	Cranbrook.
1	Cameron, N. C	Peterboro.
1	Campbell, A. J	Collingwood.
3	Campbell, A. M	Trenton.
1	Chase, A. V	Orillia.
2	Chilver, C. A	Walkerville.
2	Chilver, H. L	Walkerville.
1	Christie, U. W	Chesley.
2	Coates, P. C	Victoria, B. C.
1	Code, S. B	Smith's Falls.
1	Code, T. F	Smith's Falls.
1	Cowan, W. A	Galt.
3	Craig, S. E	Snelgrove.
1	Crerar, S. R	Brussels.
3	Currie, W. M	Port Perry.
3	Depew, H. H	Hamilton.
2	Elder, A. J	Barrie.
2	Fleck, J. G	Ottawa.
1	Ford, A. L	Toronto.
1	Foster, W. J	Windsor.
3	Gibson, Wm. S	Toronto.
1	Goodall, J. N	Bellwood.
3	Gray, A	Port Credit.
3	Gray, W. W	Uxbridge.
3	Greenwood, W. K	Greenwood.
2	Gzowski, H. N	Toronto.
1	Hara, D	Merritton.

SECOND YEAR—*Continued.*

3	Harris, C. J.....	Brantford.
3	Henderson, T. D.....	Acton.
1	Heron, J. B.....	Scarboro Junction.
1	Hill, E. M. M.....	Guelph.
2	Hill, S. N.....	St. Thomas.
2	Ingles, C. J.....	Toronto.
2	Jackson, E. R.....	Seaforth.
1	James, E. A.....	Thornhill.
1	Jermyn, P. V.....	Toronto.
3	Johnston, J. W.....	Toronto.
3	Keefe, W. S. H.....	Iroquois.
1	Kernahan, M. G.....	Toronto.
2	Laing, P. A.....	Dundas.
2	Legge, A. H.....	Jefferson.
3	McCuaig, O. B.....	Toronto.
1	McEwen, G. G.....	Moose Creek.
1	McFarlane, W. G., B. A.....	Claremont.
3	McGibbon, C. P.....	Brampton.
3	McKay, C. D.....	Maplewood.
2	Mackenzie, C. M.....	Galt.
1	McMillan, D.....	Woodville.
3	Manson, G. J.....	St. Catharines.
3	Milne, W. G.....	Brown's Corners.
3	Moore, E. E.....	Peterboro.
1	Moorhouse, W. N.....	Toronto.
2	Morton, P. E.....	Belhaven.
3	Munro, W. H.....	Peterboro.
1	O'Brien, D. E.....	Merrickville.
3	O'Sullivan, J.....	Toronto.
3	Pace, G.....	Orillia.
3	Pardoe, W. S.....	Toronto.
3	Paris, J.....	White Lake.
2	Parke, J.....	Oil City.
3	Peaker, W. J.....	Brampton.
1	Phillips, E. P. A.....	Cedarville.
3	Pickering, A. E.....	Brampton.
1	Porte, W. B.....	Toronto.

SECOND YEAR—*Concluded.*

2	Ramsey, G. L.....	Dunnville.
1	Raymond, D. L. C.....	Windsor.
1	Reid, F. B	Bowmanville.
3	Riddell, M. R.....	Toronto.
1	Robinson, L.....	Brockville.
3	Roxburgh, G. S.....	Norwood.
2	Rutherford, F. N.....	South Monaghan.
3	Sauder, P. M.....	Galt.
1	Sheply, J. D	Leamington.
3	Slater, F. W.....	London.
3	Smart, R. S.....	Toronto.
1	Smith, D. A.....	Claude.
3	Smither, W. J.....	Toronto.
1	Southworth, H. S.....	Toronto.
2	Street, P. B.....	Toronto.
1	Tait, B. J.....	Peterboro.
2	Thompson, H. P.....	Toronto.
3	Thomson, S. E.....	Blenheim.
3	Townsend, C. J.....	Toronto.
1	Townsend, D. T.....	Woodstock.
1	Trimble, A. V.....	Toronto.
3	Tucker, B. B.....	Allanburg.
2	Wade, E.....	Welland.
1	Walker, E. W... ..	Cayuga
3	Watson, J. P.....	Acacia.
1	Weddell, R. G.....	Trenton.
1	Weir, J. M.....	Toronto.
1	Wells, A. F.....	Sandwich.
1	Worthington, W. R.....	Toronto.
3	Wright, W. F.....	Toronto.
3	Yeates, P. M.....	London.
2	Young, W. H.....	Clifford.

THIRD YEAR.

3	Acres, H. G.....	Paris.
1	Alison, J. G. R.....	Toronto.
3	Angus, H. H.....	London.

THIRD YEAR—*Continued.*

3	Beatty, J. A.....	Fergus.
3	Breslove, J.....	Toronto.
2	Burd, J. H.....	Parry Sound.
1	Burgess, E. L.....	Burgessville.
2	Burwash, N. A.....	Toronto.
4	Challies, J. B.....	Winchester.
1	Clarke, F. F.....	Deer Park.
3	Coulson, C. L.....	Welland.
3	Davison, A. E.....	Prescott.
3	Fensom, C. J.....	Toronto.
2	Fuce, E. O.....	Toronto.
3	Gaby, F. A.....	Toronto.
3	George, R. E.....	Port Elgin.
1	Gardner, J. C.....	Niagara Falls.
1	Gillespie, P.	Cobourg.
1	Gordon, J. P.....	Toronto.
1	Gourlay, W. A... ..	Toronto.
2	Hamilton, J. F.....	Dunedin.
2	Hanes, G. S.....	Windsor.
5	Horton, J. A.....	Hurondale.
2	Harcourt, F. Y., B.A.....	Toronto.
1	Hayes, L. J.....	Toronto.
1	Henderson, F. D.....	Crathie.
3	Jackson, J. G.....	London.
3	Johnston, C. K.....	Pefferlaw.
1	Johnston, H.....	Meaford.
3	Lang, A. G.....	Toronto.
3	Larkworthy, W. J.....	Mitchell.
1	Latornell, A. J.....	Meaford.
1	McAuslan, H. J.....	Heathcote.
3	McFarlane, J. A.....	Donegal.
1	McNaughton, A. L.....	Cornwall.
5	Marriott, F. G.....	Toronto.
3	Maus, C. A.....	Paris.
3	Miller, M. L.....	Alymer.
3	Mitchell, P. H.....	Waterloo.
2	Montgomery, R. H.....	Brantford.
1	Moore, F. A.....	Toronto.

THIRD YEAR—*Concluded.*

1	Morley, R. W.	Toronto.
3	Mullins, E. E.	Toronto.
3	Nevitt, I. H.	Toronto.
1	Oliver, E. W.	Toronto.
3	Oliver, J. P.	Eberts.
3	Pace, J. D.	Orillia.
3	Patten, B. B.	St. George.
2	Philp, D. H.	Petrolea
3	Pinkney, D. H.	Morriston.
2	Plunkett, T. H.	Meaford.
1	Robertson, D. F.	Almonte.
1	Seymour, H. L.	Toronto.
3	Shipe, H. M.	Toronto.
3	Small, H. S.	Toronto.
1	Smith, J. H.	New Hamburg.
3	Smith, H. G.	St. Catharines.
3	Trees, S. L.	Toronto.
2	Umbach, J. E.	Elmira.
1	Waldron, J.	Pine Grove.
3	Wass, S. B.	Granton.
3	Whelihan, J. A.	St. Mary's
3	White, H. F.	London.
2	Williams, C. G.	London.
1	Wilson, N. D.	Toronto.
1	Young, C. R.	Picton.

FOURTH YEAR.

	Blair, W. J.	Embro.
	Brereton, W. P.	Bethany.
	Chace, W. G.	St. Catharines.
	Chadsey, S. B.	Wellington.
	Christie, W.	Chesley.
	Connor, H. V.	Sarginson.
	Culbert, M. T.	London.
	Elwell, W.	Toronto.
	Empey, J. M.	Thamesford.
	Forbes, D. L. H.	Toronto.

FOURTH YEAR—*Continued.*

Gagné, S.....	St. Joseph d'Alma, P.Q.
Gibson, A. E.....	Ingersoll.
Knight, R. H.....	Bruce Mines.
Langmuir, F. L.....	Toronto.
Madden, J. F. S.....	Toronto.
Mathison, P.....	Union.
Powell, G. G.....	Toronto.
Robertson, H. D.....	Walkerton.
Sinclair, D.....	Cheltenham.
Sutherland, W. H.....	Toronto.
Teasdale, C. M.....	Concord.
Zahn, H.....	Toronto.

OCCASIONAL STUDENTS.

Burton, E. F., B.A	Toronto.
Burwash, E. M.....	Toronto.
McLennan, W. S.....	Buffalo, N.Y.
Wing, J. G.....	Hamilton.

PRIZEMEN.

Engineering.

1879.— I. Year.....	J. McAREE	1st prize.
1880.—II. “	J. L. MORRIS.....	1st “
1881.— I. “	G. H. DUGGAN.....	1st “
II. “	D. JEFFREY	1st “
1882.— I. “	A. R. RAYMER.....	1st “
I. “	E. W. STERN	2nd “
II. “	G. H. DUGGAN.....	1st “
III. “	D JEFFREY.....	1st “
1883.— I. “	B. A. LUDGATE.....	1st “
I. “	A. M. BOWMAN	2nd “
II. “	A. P. RAYMER.....	1st “
II. “	E. W. STERN.....	2nd “
III. “	G. H. DUGGAN.....	1st “
1884.—II. “	B. A. LUDGATE.....	1st “
III. “	E. W. STERN	1st “
III. “	A. R. RAYMER	2nd “

PRIZEMEN—*Continued.*

1885.—	I.	Year.....	A. E. LOTT.....	1st prize.
	I.	"	.....J. ROGERS	2nd "
	II.	"	.....T. K. THOMSON	1st "
	III.	"	.....B. A. LUDGATE.....	1st "
1886.—	I.	"	.....C. H. C. WRIGHT	1st "
	I.	"	.....J. E. ROSS.....	2nd "
	II.	"	.....A. E. LOTT.....	1st "
1887.—	I.	"	.....H. E. T. HAULTAIN.....	1st "
	II.	"	.....C. H. C. WRIGHT	1st "
	III.	"	.....A. E. LOTT.....	1st "
	III.	"	.....J. ROGERS	2nd "
1888.—	I.	Year.....	E. B. MERRILL.....	1st "
	I.	"	.....F. M. BOWMAN.....	2nd "
	II.	"	.....D. D. JAMES.....	1st "
	III.	"	.....C. H. C. WRIGHT.....	1st "
1889.—	I.	"	.....J. K. ROBINSON.....	1st "
	I.	"	.....G. E. SILVESTER.....	2nd "
	II.	"	.....E. B. MERRILL.....	1st "
	II.	"	.....F. M. BOWMAN.....	2nd "
	III.	"	.....D. D. JAMES.....	1st "
1890.—	I.	"	.....C. FAIRCHILD	1st "
	II.	"	.....J. K. ROBINSON.....	1st "
	III.	"	.....F. M. BOWMAN.....	1st "
	III.	"	.....E. B. MERRILL.....	2nd "
1891.—	I.	"	.....A. J. MCPHERSON.....	1st "
	I.	"	.....R. B. WATSON.....	2nd "
	II.	"	.....J. B. GOODWIN.....	1st "
	III.	"	.....G. E. SILVESTER.....	1st "
	III.	"	.....C. W. DILL.....	2nd "
1892.—	I.	"	.....A. E. BERGEY.....	1st "
	I.	"	.....R. W. ANGUS	2nd "
	II.	"	.....A. J. MCPHERSON.....	1st "
	II.	"	.....R. B. WATSON.....	2nd "
	III.	"	.....E. J. LASCHINGER.....	1st "
	III.	"	.....C. FAIRCHILD.....	2nd "

The grant for prizes was withdrawn at the close of 1892.

Architecture.

The prize in Architecture was the gift of Mr. D. B. Dick, Architect, Toronto.

- 1891.—I. Year.....H. F. BALLANTYNE.
 1892.—I. “J. A. EWART.
 1893.—I. “A. H. HARKNESS.
 1894.—I. “E. A. FORWARD.
 1895.—I. “W. F. SCOTT.
 1896.—I. “D. MACKINTOSH.
 1899.—I. “W. F. SHEPHERD.

Civil Engineering.

The prize in Civil Engineering is the gift of Mr. T. Kennard Thomson, C.E., New York.

- 1897.—III, Year.....M. B. WEEKES.
 1898.—III. “J. A. STEWART.
 1899.—III. “T. SHANKS.
 1900.—III “E. H. PHILLIPS
 1901.—III. “H. P. RUST.
 1902.—III. “W. F. RATZ.

Mechanical and Electrical Engineering.

Donor, Mr. F. A. Riehle, Philadelphia.

- 1997.—III. Year.....A. T. GRAY.
 1898.—III. “F. C. SMALLPEICE.

UNIVERSITY OF TORONTO.**Degree of Bachelor of Applied Science (B.A. Sc.**

Date of admission.	Name.	Date of admission.	Name.
1893..	Alison, T. H.	1902 *	Boswell, M. C.
1987 *	Angus, R. W.	1899..	Boyd, W. H.
1901..	Ardagh, E. G. R.	1902..	Brandon, E. T.
1896..	Armstrong, J.	1896..	Brodie, W. M.
1897 *	Bain, J. W.	1895..	Bucke, W. A.
1894 *	Ballantyne, H. F.	1900..	Burnside, J. T. M.
1901..	Barley, J. H.	1898..	Carpenter, H. S.
1902..	Barrett, R. H.	1899..	Carter, W. E. H.
1895..	Beauregard, A. T.	1898..	Charlton, H. W.

* Degree with honors.

DEGREE OF BACHELOR OF APPLIED SCIENCE.—*Continued.*

Date of admission.	Name.	Date of admission.	Name.
1894.	*Chewett, H. J.	1893	*Laschinger, E. J.
1900	*Chubbuck, L. B.	1901..	Latham, R.
1902..	Cockburn, J. R.	1893	*Lawson, W.
1900..	Coulthard, R. W.	1893	Lea, W. A.
1901..	Craig, J. A.	1894..	McAllister, A. L.
1901..	Davison, J. E.	1895..	McAllister, J. E.
1902..	DeCew, J. A.	1893..	McAree, J.
1901..	Dickson, G. W.	1897..	Macallum, A. F.
1901	*Dixon, H. A.	1893..	McEntee, B.
1896..	Dobie, J. S.	1896	*McGowan, J.
1902	*Eason, D. E.	1896.*	McKinnon, H. L.
1897	*Elliott, H. P.	1901..	McMillan, J. G.
1895	*Ewart, J. A.	1894.*	McPherson, A. J.
1901..	Foreman, W. E.	1895..	McTaggart, A. L.
1894	*Goodwin, J. B.	1902	*McVean, H. G.
1899..	Grant, W. F.	1897..	Macbeth, C. W.
1898..	Gray, A. T.	1897..	Martin, T.
1901..	Guy, E.	1894	*Merrill, E. B.
1897	*Haight, H. V.	1893..	Milne, C. G.
1900..	Hare, W. A.	1896..	Mines, W. H.
1897	*Harkness, A. H.	1895	*Minty, W.
1902..	Harvey, C.	1894..	Mitchell, C. H.
1901..	Hemphill, W.	1900..	Monds, W.
1895..	Herald, W. J.	1901..	Neelands, E. V.
1901	.Holcroft, H. S.	1901..	Pope, A. S. H.
1896..	Hull, H. S.	1902	*Price, H. W.
1894..	James, D. D.	1900.*	Revell, G. E.
1893..	James, O. S.	1900..	Richards, E.
1895.*	Job, H. E.	1901..	Roaf, J. R.
1895..	Johnson, S. M.	1898.*	Robinson, A. H. A.
1902..	Johnson, J. A.	1902..	Rust, H. P.
1896..	Johnson, A. C.	1901..	Saunders, H. W.
1894	*Keele, J.	1902..	Sauer, M. V.
1899..	Korman, J. S.	1900	*Shanks, T.
1894..	Laidlaw, J. T.	1895..	Shields, J. D.
1893..	Laing, A. T.	1899..	Shipley, A. E.

* Degree with honors.

DEGREE OF BACHELOR OF APPLIED SCIENCE—*Concluded.*

Date of admission.	Name.	Date of admission.	Name.
1902	*Smallpeice, F. C.	1901..	Thorne, S. M.
1898..	Smiley, R. W.	1901..	Thorold, F. W.
1894	*Speller, F. N.	1896..	Tremaine, R. C. C.
1894...	Squire, R. H.	1900..	Wagner, W. E.
1902..	Stevenson, W. H.	1898..	Weekes, M. B.
1898.	*Stull, W. W.	1901..	Weir, H. M.
1900.	*Tennant, D. C.	1899.	*Williamson, D. A.
1901..	Tennant, W. C.	1893.	*Wright, C. H. C.
1893..	Thomson, R. W.	1902..	Wright, R. T.

Degree of Civil Engineer (C.E.).

1899..	Alison, T. H.	1886..	Kennedy, J. H.
1898..	Ashbridge, W. T.	1895..	McAllister, J. E.
1895..	Bowman, A. M.	1901..	McDowall, R.
1893..	Bowman, F. M.	1898..	Mitchell, C. H.
1892..	Chewett, H. J.	1896..	Moore, J. E. A.
1900..	Connor, A. W.	1885..	Morris, J. L.
1901..	Francis, W. J.	1892..	Thomson, T. K.
1900..	Haultain, H. E. T.	1894..	Tyrrell, H. G.
1893..	Innes, W. L.	1889..	Tyrell, J. W.

Degree of Mining Engineer (M.E.).

Date of admission.	Name.
1897.....	Bucke, ^{es} M. A.
1900.....	Laidlaw, J. T.

Degree of Mechanical Engineer (M.E.).

Date of admission.	Name.
1900.....	White, A. V.
1901.....	Johnston, A. C.

Degree of Electrical Engineer (E.E.).

Date of admission.	Name.
1896.....	Ross, R. A.
1902.....	Elliott, H. P.

* Degree with honors.

GRADUATES.

NOTE.—Graduates are requested to inform the Registrar of changes in their addresses.

1881

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1	J. L. MORRIS, C.E., O.L.S..... Pembroke, Ont.	Engineer and Surveyor.

1882

1. D. JEFFREYContractor.
Delmar, Iowa.
1. J. H. KENNEDY, C.E., O.L.S....Chief Engineer Vancouver, Victoria
Vancouver, B.C. & Eastern Ry.
1. J. McAREE, B.A.Sc., D.T.S.....Dominion Land Surveys, N.W.T.
Ottawa, Ont.

1883

1. D. BURNS, O.L.S..West Side Belt R. R.,
A.M. Can. Soc. C.E., Pittsburg Bank for Savings Build-
Pittsburgh, Pa. ing.
1. G. H. DUGGAN, M. Can. Soc. C.E. Chief Engineer, Dominion Iron &
Sydney, N.S. Steel Co.
1. J. W. TYRRELL, C.E., D.L.S.....Consulting Engineer and Surveyor.
Hamilton, Ont.

1884

1. W. C. KIRKLANDChief Engineer Drainage Commis-
New Orleans, La. sion of New Orleans.
1. J. McDUGGALL, B.A.....York County Engineer.
A.M. Inst. C.E.,
Court House, Toronto, Ont.
1. A. R. RAYMER,.....Asst. Chief Engineer, P. & L. E.
Pittsburgh, Pa. Ry.
1. JAMES ROBERTSON, O.L.S.....Engineer and Surveyor.
Glencoe, Ont.
1. E. W. STERN.....Consulting Engineer, Steel Struc-
M. Am. Soc. C.E. tures, Buildings, etc.
1133 Broadway, New York.

1885

1. F. W. BLEAKELY.....Civil Engineer.
Sullivan Block, Seattle, W.T.
1. H. J. BOWMAN, D. & O.L.S.....Consulting Engineer.
M. Can. Soc. C.E., (County Clerk and Treasurer.)
Berlin, Ont.
1. E. E. HENDERSON, O.L.S.,.....Civil Engineer.
Henderson, P.O., Me.
1. B. A. LUDGATE, O.L.S.....Asst Engineer, P. & L. E. Ry.
Pittsburgh, Pa.
1. O. McKAY, O.L.S.....Chief Engineer, Lake Erie and De-
Walkerville, Ont. troit River Ry.

1886

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	A. M. BOWMAN, D.L.S.....	Engineer, Evansville Contract Co. Pittsburgh, Pa.
1.	E. B. HERMON, D. & O.L.S.....	Garden, Hermon & Burwell, Vancouver, B.C. Engineers and Surveyors.
1.	ROBERT LAIRD, O.L.S.....	Engineer on Construction, North Bay, Ont. Temiskaming Ry.
1.	T. KENNARD THOMSON, C.E.....	Consulting Engineer. M. Am. Soc. C.E., 13-21 Park Row, New York.
1.	H. G. TYRRELL, C.E.....	Consulting Engineer. A.M. Can. Soc. C.E. 1429 Cedar Ave. Cleveland, O.

1887

1. J. C. BURNS (deceased.)
1. A. E. LOTT. Consulting Railway Engineer.
Mexico, Mexico.
1. A. L. McCULLOCH, O.L.S..... City Engineer.
A.M. Can Soc. C. E.
Nelson, B.C.
1. F. MARTIN, M.B. O.L.S..... Physician.
1. C. H. PINHEY, D. & O.L.S..... Engineer for contractor, Soulanges
Coteau Landing. Canal.
1. J. ROGERS, O.L.S..... Town Engineer.
Mitchell, Ont.

1888

1. J. F. APSEY, O. L. S..... With James River Construction Co.
115 East Franklin St.,
Richmond, Va.
1. W. T. ASHBRIDGE..... Town Engineer, Lindsay, Ont.
Temple Building, Toronto,
Ont.
1. EDWARD F. BALL..... Civil Engineer.
A.M. Can. Soc. C.E., Room
400, Grand Central Station,
New York, N.Y.
1. D. B. BROWN, O.L.S..... Civil Engineer.
Cuidad de Guatemala,
Guatemala.
1. C. M. CANNIFF..... Engineer, Expanded Metal and
Toronto. Fireproofing Co.
1. H. J. CHEWITT, C.E., B.A.Sc.,.... Mining Engineer.
A.M. Can. Soc. C.E.
83½ York St., Toronto, Ont.

1888—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	J. GIBBONS, D. & O.L.S.....	Surveying Staff, Dep't of Interior. Ottawa, Ont.
1.	R. McDOWALL, O.L.S., C.E.....	Town Engineer. A.M. Can. Soc. C.E. Owen Sound, Ont.
1.	G. W. McFARLEN, O.L.S.....	City Engineer's Staff. Toronto, Ont.
1.	C. J. MARANI.....	Manager, Canada Permanent and P.O. Box 245, Western Canada Mortgage Cor- Vancouver, B.C. poration.
1.	G. R. MICKLE, B. A.....	Lecturer in Mining Engineering Toronto, Ont. School of Practical Science.
1.	J. H. MOORE, O.L.S..	Town Engineer. Smith's Falls, Ont.
1.	G. H. RICHARDSON.....	Assist City Engineer. Ottawa, Ont.
1.	K. ROSE.....	Civil and Mining Engineer. 62 William St., New York.
1.	J. E. ROSS, D. & O.L.S.....	Surveying Staff, Dept. of Interior. Kamloops, B.C.
1.	C. H. C. WRIGHT, B.A.Sc.....	Professor of Architecture, Toronto, Ont. School of Practical Science.

1889

1.	B. CAREY, Toronto, Ont.	
1.	W. J. CHALMERS.....	Draftsman, Riter-Conley Mfg. Co. Pittsburgh, Pa.
1.	W. A. CLEMENT.....	Sewer Engineer, Staff of City A. M. Can. Soc. C.E., Engineer. Toronto, Ont.
1.	G. F. HANNING.....	Engineering Staff, Ont. & Rainy Port Arthur, Ont. River Ry.
1.	H. E. T. HAULTAIN, C.E.....	Mining Engineer. M. Can. Soc. C.E. Nelson, B.C.
1.	J. IRVINE.....	Civil Engineer. Harriston, Ont.
1.	D. D. JAMES, B.A.....	Engineering Staff, Algoma Commercial Co. B. A. Sc. O.L.S. Sault Ste. Marie, Ont.
1.	F. X. MILL (deceased).	
1.	H. K. MOBERLY	With Quebec Fire Assurance Co. Innisfail, Alberta.

1889—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	T. R. ROSEBRUGH, M.A. . . .	Professor in Electrical Engineering Toronto, Ont. School of Practical Science.
1.	T. WICKETT, M.D.	Physician. Watford, Ont.

1890.

5. W. E. BOUSTEAD (deceased).
- 1 F. M. BOWMAN, O.L.S., C.E. . . . Structural Engineer,
Pittsburgh. Pa. Riter-Conley Mfg. Co.
1. M. A. BUCKE, M. E. (deceased).
1. G. D. CORRIGAN (deceased).
1. J. A. DUFF, B.A. (deceased).
1. A. B. ENGLISH (deceased).
1. N. L. Garland. Garland Manufacturing Co.
76 Bay St., Toronto, Ont.
1. J. HUTCHEON, O.L.S. City Engineer.
Guelph, Ont.
1. W. L. INNIS, O.L.S., C. E. . . . Manager, Simcoe Canning Co.
Simcoe, Ont.
1. E. B. MERRIL, B. A., B.A.Sc. . . Mechanical Engineering Dept.,
Pittsburgh, Pa. Westinghouse Electric & Mfg. Co.
1. J. R. PEDDER (deceased).
3. R. A. ROSS, E.E. Consulting, Electrical and Mechanical
17 St. John St. Engineer.
Montreal, P.O.
1. T. H. WIGGINS, O.L.S. Drainage Engineer.
Finch, Ont.
1. W. J. WITHROW Patent Examiner, Patent Branch,
Ottawa, Ont. Dept. of Agriculture.

1891.

1. H. J. BEATTY, O.L.S. Engineer & Surveyor.
Eganville, Ont.
- 1 T. R. DEACON, O.L.S. Managing Director,
Rat Portage, Ont. Mikado Gold Mining Co.
- 1 C. W. DILL Roadways Engineer,
Toronto, Ont. Staff of City Engineer.
- 5 O. S. JAMES, B.A. Sc Analytical Chemist and Assayer, 227
Toronto, Ont. George St.
1. A. LANE Civil Engineer.
Angus New Mexico
1. J. E. McALLISTER, C.E., B.A.Sc. . Smelting Supt., British Columbia
Greenwood, B. C. Copper Smelting Works.

1891.—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	E. B. MERRILL, B.A., B.A. Sc.	Mechanical Engineering Dept., Pittsburgh, Pa.
		Westinghouse Electric Mfg. Co.
1.	J. E. A. MOORE, C.E.	Estimating Engineer, Wellman- Cleveland, O.
		Seaver & Morgan Engineering Co.
1.	W. NEWMAN, O.L.S.	City Engineer.
	A. M. Can. Soc. C.E.	
	Windsor, Ont.	
1.	J. K. ROBINSON (deceased).	
1.	W. B. RUSSEL	Chief Engineer,
	North Bay, Ont.	Temiskaming & Northern Ry.
1.	G. E. SILVESTER, O.L.S.	DeMorest & Silvester, Civil and Sudbury, Ont.
		Mining Engineers.
1.	H. D. SYMMES	Contractor's Engineer,
	Niagara Falls, Ont.	Ontario Power Co.

1892.

1.	J. R. ALLAN, O.L.S.	Ranchman.
	Macleod, Alta.	
1.	T. H. ALISON, B.A. Sc., C.E.	Chief Engineer, Augustes Smith 39-41 Cortland St., New York.
		Co.
1.	A. G. ANDERSON,	
	Port Dover, Ont.	
1.	C. FAIRCHILD, D. & O.L.S.	Surveying Staff, Dept. of Interior. Ottawa, Ont.
1.	J. B. GOODWIN, B.A.Sc.	Asst. Engineer Niagara Falls Niagara Falls, N.Y.
		Power Co.
4.	C. E. LANGLEY	Langley & Langley, Architects. Can Life Bldg., Toronto, Ont.
1.	A. T. LAING, B.A.Sc.	Registrar, Toronto, Ont.
		School of Practical Science.
1.	E. J. LASCHINGER, B.A.Sc.	Asst. Engineer, Consolidated Gold Johannesburg.
		Fields of South Africa.
	Transvaal, S.A.	
5.	W. LAWSON, B.A.Sc.	Chief Chemist and Asst. Manager Alvarado, Cal.
		Alameda Sugar Co.
3.	W. A. LEA, B.A.Sc.	Mechanical Engineer, Mexico, Mexico.
		Mexico Street Ry.
1.	B. McENTEE, B.A.Sc.,	
	28 Queen St. E., Toronto, Ont.	
3.	C. G. MILNE, B.A.Sc.	Chief Engineer, Hamilton Bridge Hamilton, Ont.
		Works Co.
1.	CHAS. H. MITCHELL, B.A.Sc.	Hydraulic Engineer, C.E., M.Can.Soc.C.E.,
		Ontario Power Co.
	Niagara Falls, Ont.	

1892—Continued.

COURSE.*	NAME AND ADDRESS.	OCCUPATION.
1.	N. L. PLAYFAIR.....	Superintendent, Playfair Lumber Midland, Ont. Co.
1.	J. M. PRENTICE (deceased).	
1.	J. A. ROSS	Chief Draftsman L. S. & M. S. Ry. Cleveland, O.
1.	ALBERT N. SMITH	Superintending representative of 330 Main St. Pittsburg, Pa. Julian Kennedy, Consulting Engineer.
1.	R. W. THOMSON, B.A.Sc.....	Consulting Mining Engineer. Johannesburg, Transvaal, S.A.
3.	A. V. WHITE, M.E.	Toronto, Ont.

1893.

1.	J. A. ARDAGH.	Staff of Division Engineer, C.P.R. Toronto, Ont.
4.	*H. F. BALLANTYNE, B.A.Sc....	Firm of Ballantyne & Evans, Archi- New York. tects and Engineers, 20 Nassau St.
1.	G. L. BROWN, O.L.S.	County Engineer, Dundas, Stormont Morrisburgh, Ont. and Glengarry.
1.	*L. C. CHARLESWORTH	Dominion Land Office. Regina, Sask.
1.	T. H. DUNN	Firm of Dunn & Fullerton, Civil Winchester, Ont. Engineers.
1.	J. M. R. FAIRBAIRN, O. L. S.	Resident Engineer, C.P.R. Ottawa, Ont.
4.	*W. FINGLAND.....	Architect. 39 Caryl Ave., Yonkers N.Y.
1.	C. FORESTER,	Toronto, Ont.
1.	*W. J. FRANCIS, C. E. ...	Engineer of Hydraulic Lift Locks, M. Can. Society, C.E., Trent Canal. Peterboro, Ont.
3.	*A. R. GOLDIE	Manager, Goldie & McCulloch En- Galt, Ont. gine Works.
3.	S. C. HANLY	Mechanical Engineer. Midland, Ont.
4.	*J. KEELE, B.A. Sc.....	Geological Survey. Ottawa, Ont.
1.	J. T. LAIDLAW, B.A.Sc., M.E.	Consulting Mining Engineer. Fort Steele, B.C.

* Diploma with honors.

1893—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	F. L. LASH..... Batavia, Java.	Manager, Batavia Electric Light Co.
1.	A. L. McALLISTER, B. A. Sc..... Trenton, N.J.	Draftsman, American Steel Corporation.
1.	T. J. McFARLEN..... Ferrona, N.S.	Chief Chemist, Nova Scotia Steel Co.
1.	*A. J. McPHERSON, B.A. Sc. D.L.S., Dawson, Yukon Terr.	Mining Engineer & Surveyor.
1.	A. F. McCALLUM, B.A.Sc. Toronto, Ont.	Lecturer, Toronto Technical School
1.	W. T. MAIN..... Brampton, Ont.	Civil Engineer.
1.	V. G. MARANI..... Cleveland, Ohio.	Assistant Engineer Cleveland Gas, Light and Coke Co.
1.	W. MINES, B.A., Sc..... Cleveland, Ohio.	With Brown Hoisting Co.
	*J. M. ROBERTSON..... Montreal, P.Q.	Superintendent, Motor and Repair Dept., Montreal Light, Heat and Power Co.
1.	R. RUSSEL..... North Bay, Ont.	Asst. Chief Engineer Temiskaming Railway.
1.	*F. N. SPELLER, B. A. Sc..... McKeesport, Pa.	Chemist, National Tube Works Co.
1.	R. H. SQUIRE, B.A. Sc., O.L.S..... Brant Chambers, Brantford, Ont.	Engineer, Ontario Portland Cement Co.
1.	W. V. TAYLOR, O.L.S..... A.M., Can. Soc. C.E. Montreal, P.Q.	Engineering Staff, Locomotive and Machine Co. Ltd.
1.	*R. B. WATSON..... Dawson, Yukon Terr.	Mining Engineer.

1894

3.	*R. W. ANGUS, B.A. Sc..... Toronto, Ont.	Lecturer in Mechanical Engineer- ing, School of Practical Science.
1.	H. F. BARKER..... Toronto.	With Office Specialty Mfg. Co.
1.	A. T. BEAUREGARD, B.A. Sc..... Philadelphia, Pa.	With United Gas Improvement Co.
1.	A. E. BERGEY..... Pittsburgh, Pa.	With American Bridge Co., Key- stone Branch.

* Diploma with honors.

1894—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	D. G. BOYD..... Michipicoten, Ont.	Inspector of Mines.
3.	W. A. BUCKE..... Toronto, Ont.	With Canadian General Electric Co.
1.	J. CHALMERS, O.L.S..... A.M. Can Soc. C. E., Winnipeg, Man.	Asst. Engineer, Canadian Northern Ry.
4.	*J. A. EWART, B.A.Sc. Ottawa, Ont.	Arnoldi & Ewart, Architects.
3.	W. J. HERALD, B.A.Sc. Sydney, N.S.	With Dominion Iron and Steel Co.
3.	H. E. JOB, B.A.Sc..... Hamilton, Ont.	Manager, Toronto & Hamilton Electric Co.
3.	A. C. JOHNSTON, B.A. Sc., M.E.... Bristol, Pa.	Consulting Mechanical Engineer.
1.	S. M. JOHNSTON, B.A. Sc., P.L.S... Greenwood, B.C.	City Engineer.
1.	J. E. JONES..... Pittsburgh, Pa.	Manager, M. H. Treadwell & Co., Engineers, Founders and Ma- chinists.
3.	N. M. LASH..... Montreal, P.Q.	Asst. Electrical Engineer, Bell Telephone Co.
1.	*A. L. McTAGGART, B.A.Sc..... McKeesport, Pa.	Draftsman, National Tube Works Co.
3.	*W. MINTY, B.A.Sc..... Manchester, Eng.	Consulting Engineering Dept., Na- tional Boiler & General Insurance Co.
3.	C. J. NICHOLSON, Preston, Ont.	
1.	H. ROLPH..... Dawson City, Yukon Ter.	Mining Engineer.
1.	J. D. Shields, B.A.Sc. Toronto, Ont.	Staff of City Engineer.
3.	A. K. SPOTTON Galt, Ont.	With Goldie & McCulloch Engine Works.
1.	ANGUS SMITH, O.L.S..... Stratford, Ont.	City Engineer.
3.	R. T. WRIGHT, B.A.Sc. Pittsburgh, Pa.	Draftsman, Westinghouse Machine Co.

1895

1.	J. ARMSTRONG, B.A.Sc. Edmonton, N.W.T.	Locating Engineer Can. Northern Railway Co.
----	--	--

* Diploma with honors.

1895—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	A. E. BLACKWOOD.....	Manager, New York Office, 71 Broadway, New York. Sullivan Machinery Co.
1.	E. J. BOSWELL, D.L.S.....	Asst. Engineer C.P.R. Winnipeg, Man.
3.	G. BREBNER.....	With General Electric Co. Schenectady, N.Y.
3.	W. M. BRODIE, B.A.Sc.....	With the Green Engineering Co. of Pittsburgh, Pa. Chicago.
3.	L. L. BROWN.....	Supt. Foundation and Contracting New York, N.Y. Co., 35 Nassau St.
	R. J. CAMPBELL.....	Artist, Chicago Tribune. Chicago, Ill.
3.	A. W. CONNOR, B.A.,C.E.....	Engineering Department, Canada Toronto, Ont. Foundry Co.
1.	J. S. DOBIZ, B.A. Sc.....	Mining Engineer. Bruce Mines, Ont.
1.	F. W. GUERNESY.....	Engineer, White Bear Mining Co, Rossland, B.C.
4.	*A. H. HARKNESS, B.A.Sc.....	Engineering Dept. Canada Foundry Toronto, Ont, Co.
3.	H. S. HULL, B.A.,Sc.....	With Vulcan Iron Works. Wilkes Barre, Pa.
3.	*J. MCGOWAN, B.A.,B.A.Sc., ...	Lecturer in Applied Mechanics, Toronto, Ont. School of Practical Science,
3.	W. N. MCKAY.....	With Bank of Hamilton. Hamilton, Ont.
3.	H. L. MCKINNON, B.A.Sc.....	With the Brown Hoisting Machine Cleveland, O. Co.
1.	W. W. MEADOWS, O.L.S.....	Engineering Staff L.E. & D.R. Ry. Walkerville, Ont.
1.	F. J. ROBINSON, D. & O.L.S.....	District Engineer, Southern Alberta. Macleod, Alta.
3.	F. T. STOCKING.....	With Pike's Peak Power Co. Victor, Col.
3.	R. C. C. TREMAINE, B.A.Sc.....	(Deceased.)

1896

2.	*J. W. BAIN, B.A.Sc.....	Lecturer in Applied Chemistry, Toronto, Ont. School of Practical Science.
2.	L. T. BURWASH.....	Mining Recorder, Timber and Stewart River P.O., Yukon Crown Lands Agent.

* Diploma with honors.

1896—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	*G. M. CAMPBELL..... Pittsburgh, Pa.	Electrical Engineer, P. & L. E. Ry. Co.
2.	J. A. DECEW, B.A.Sc..... Windsor Mills, P.Q.	Chemist, Canada Paper Co.
3.	*H. P. ELLIOTT, B.A.Sc., M.E.... Pittsburgh, Pa.	Electrical Engineer, Westinghouse Electric and Mfg. Co.
3.	W. C. GURNEY..... Toronto Ont.	Vice-President Gurney Foundry Co.
3.	*H. V. HAIGHT, B.A.Sc..... Sherbrooke, P.Q.	Engineer, Canadian Rand Drill Co.
1.	W. F. LAING..... Sault Ste. Marie, Ont.	Engineer on construction, Algoma Central Ry. Co.
3.	R. R. LAWRIE (deceased).	
3.	C. MACBETH, B.A.Sc..... Detroit, Mich.	Engineering Staff, Michigan Central Railroad.
3.	J. A. MCMURCHY..... Pittsburgh, Pa.	With Westinghouse Machine Co.
1.	T. MARTIN, B.A.Sc..... Port Arthur, Ont.	Engineering Staff, Ontario Rainy River Ry.
3.	R. R. SHIPE..... Toronto, Ont.	With Toronto Engraving Co.

1897

2.	E. ANDREWES, B.Sc..... Blaenau, Festiniog, N.Wales.	Res. Engineer, Main Offeren Slate Quarry Co.
2.	*J. A. BOW..... Butte, Mon.	Mining Engineer.
1.	H. S. CARPENTER..... B.A.Sc., O.L.S., Peterboro, Ont.	Asst. Engineer, Trent Valley Canal.
5.	H. W. CHARLTON, B.A. Sc..... Ottawa, Ont.	Assistant Analyst at Experimental Farm.
4.	*E. A. FORWARD..... A.M. Can. Soc. C.E. Dickinson's Landing, Ont.	Asst. Engineer, Cornwall Canal.
3.	*A. T. GRAY, B.A.Sc..... Schenectady, N.Y.	With General Electric Co.
3.	W. A. B. HICKS..... Buffalo, N.Y.	With Lackawanna Steel Co.
4.	C. F. KING..... Ottawa, Ont.	Geological Survey.
1.	H. W. PROUDFOOT..... Matawin, Ont.	With Jack Lake Mining Co.

* Diploma with honors.

1897—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
2. *A. H. A. ROBINSON, B.A.Sc.	Westville, N.S.	With Intercolonial Coal Mining Co., Limited.
4. W. F. SCOTT.....	Berkeley, Cal.	Structural Engineer for J. G. Howard, Archt. University of California.
3. *R. W. SMILEY, B.A.Sc.	Cleveland, O.	With Wellman-Seaver & Morgan Engineering Co.
2. *W. W. STULL, B.A.Sc., O.L.S....	Sudbury, Ont.	With DeMorest & Silvester, Engineers and Surveyors.
1. *M. B. WEEKES, B.A.Sc., D.L.S..	Ottawa, Ont.	Surveying Staff, Dept. of the Interior.
1. E. A. WELDON	Winnipeg, Man.	Engineering Staff, Can. Northern Ry.

1898

1. W. H. BOYD, B.A.Sc.....Geological Survey.
Ottawa, Ont.
2. W. E. H. CARTER, B.A.Sc.Secretary, Bureau of Mines.
Toronto, Ont.
3. E. H. DARLING.....With Hamilton Bridge Works Co.
Hamilton, Ont.
1. W. F. GRANT, B.A.Sc.Town Engineer.
Sault Ste. Marie.
1. T. S. KORMANN, B.A.Sc.Manager, Kormann Brewing Co.
Toronto, Ont.
3. J. E. LAVROCK.With Niagara Falls Power Co.
Niagara Falls, N.Y.
4. D. MACKINTOSHPost Graduate Course,
Ithaca, N.Y. Cornell University.
1. F. W. MCNAUGHTON, O.L.S.Town Engineer.
Cornwall, Ont.
1. J. H. SHAW, O.L.S.Surveyor.
North Bay, Ont.
3. A. E. SHIPLEY, B.A.Sc.....With United Coke & Gas Co.
277 Broadway,
New York, N.Y.
3. *F. C. SMALLPEICE, B.A.Sc.With Canadian General Electric Co.
Toronto, Ont.
1. R. W. SMITH, P.L.S.....Surveyor.
Rossland, B.C.
1. *J. A. STEWART, M.A.....Estimating and Designing Dept.,
Pittsburgh, Pa. McClellent-Marshall Construction Co.

* Diploma with honors.

1898—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	*H. L. VERCOE	Engineering Staff, Winnipeg, Man. Can. Northern Ry.
3.	T. A. WILKINSON	Electrical Engineer, Ballantyne & New York, N.Y. Evans, 20 Nassau st.
3.	D. A. WILLIAMSON, B.A.Sc.	With Hamilton Bridge Works Co. Hamilton, Ont.

1899

3.	T. BARBER	With Georgian Foundry. Meaford, Ont.
2.	J. T. M. BURNSIDE, B.A.Sc.	Lieut. Gold Coast Reg. West African Gold Coast W. Africa. Frontier Force.
3.	L. B. CHUBBUCK, B.A.Sc.	Engineering Dept., Westinghouse Pittsburgh, Pa. Electric and Mfg. Co.
2.	G. A. CLOTHIER	With St. Eugene Construction and Moyie, B.C. Milling Co., Limited.
1.	C. COOPER	Surveyor. Carlyle, Assa.
2.	R. W. COULTHARD, B.A.Sc.	Chief Chemist, Crow's Nest Pass Fernie, B.C. Coal Co.
3.	J. A. CRAIG, B.A.Sc.	Office of Delano-Osborne Engineering Toronto, Ont. Co.
2.	J. C. ELLIOT	With Mother Lode Mine. Bella Bella, B.C.
3.	W. E. FORMAN, B.A.Sc.	With the Westinghouse Electric and Pittsburgh, Pa. Mfg. Co.
3.	E. GUY, B.A.Sc.	Engineering Dpt. Westinghouse Pittsburgh, Pa. Electric and Mfg. Co.
3.	*W. A. HARE, B.A.Sc.	With Illinois Steel Co. Joliet, Ill.
1.	R. LATHAM, B.A.Sc.	Asst. Engineer, T. H. & B. Ry. Hamilton, Ont.
3.	W. MONDS, B.A.Sc.	Engineer for Munro & Piggot con- Webbwood, Ont. tractors.
1.	J. PATTERSON, B.A.	Professor of Physics, Muir Central Allahabad, India. College.
3.	A. S. H. POPE, B.A.Sc.	Testing Dpt. Westinghouse Electric Pittsburgh, Pa. & Mfg. Co.
2.	*G. E. REVELL, B.A.Sc.	Office of Ross & Holgate, Engineers. Montreal, P.Q.
3.	*E. RICHARDS, B.A.Sc.	With Toronto Electric Light Co. Toronto, Ont.

* Diploma with honors.

1899—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	G. A. SAUNDERS	With General Electric Co. Schenectady, N. Y.
	*T. SHANKS, B.A.Sc., D.L.S.....	Topographical Surveys Branch, Dept. Ottawa, Ont. of the Interior.
1.	*D. C. TENNANT, B.A.Sc.....	With Dominion Bridge Co. Montreal, P. Q.
3.	W. W. VANEVRY.....	With Lackawana Steel Co. Lebanon, Pa.
2.	G. H. WATT, D.L.S.....	Topographical Surveys Branch, Dept. Ottawa, Ont. of Interior.
3.	W. E. WAGNER, B.A.Sc.....	Fellow in Mechanical Engineering Toronto, Ont. School of Practical Science.
3.	E. YEATES.....	With London Machine Tool Co. London, Ont.

1900

1.	J. L. ALLAN.....	Office of Provincial Engineer. Halifax, N. S.
2.	E. G. R. ARDAGH, B.A.Sc.....	Fellow in Chemistry, Toronto, Ont. School of Practical Science.
3.	J. A. BAIN.....	Structural Dept. S. V. Huber & Co., Pittsburgh, Pa. Constructing Engineers.
3.	J. H. BARLEY, B.A.Sc.....	With Stanley Electric Mfg Co. Pittsfield, Mass.
2.	*M. C. BOSWELL, B.A.Sc.....	Lecture Assistant, Toronto, Ont. School of Practical Science.
1.	L. T. BRAY, D.L.S.....	Surveyor. Galt, Ont.
3.	J. CLARK.....	Mechanical Engineer, Grace Mine. Michipicoten Harbor, Ont.
2.	J. E. DAVISON, B.A.Sc.,	Asst. Engineer, Toronto St. Ry. Toronto, Ont.
3.	E. D. DICKINSON	With General Electric Co. Schenectady, N. Y.
3.	G. W. DICKSON, B.A.Sc.....	Electrical Construction Department, Buffalo, N. Y. Lackawana Steel Co.
2.	*H. A. DIXON, B.A.Sc., O.L.S....	Office of J. H. Moore, O.L.S., Smith's Falls, Ont. Engineer and Surveyor.
2.	C. H. FULLERTON	Firm of Dunn and Fullerton, Civil Winchester, Ont. Engineers.
3.	W. S. GUEST	Draftsman. C. H. Riches & Co., Toronto. Patent Solicitors.

* Diploma with honors.

1900—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
3.	W. HEMPHILL, B.A.Sc.	With Cataract Power and 40 Court St., Buffalo, N.Y. Conduit Co.
3.	S. E. M. HENDERSON.	With General Electric Co. Schenectady, N.Y.
3.	J. A. HENRY	With General Electric Co. Schenectady, N. Y.
2.	H. S. HOLCROFT, B.A.Sc., D.L.S.,	Surveyor. Toronto, Ont.
3.	H. A. JOHNSTON.....	Cleveland Variety Works. Cleveland, O.
3.	J. C. JOHNSTON	City Engineer's Staff. Toronto, Ont.
2.	*J. A. JOHNSTON, B.A.Sc.,.....	Asst. Mines Manager, Sault Ste. Marie, Ont. Algoma Commercial Co.
2.	R. E. MCARTHUR,	Engineering Staff, Pennsylvania Ry. Pittsburgh, Pa.
2.	J. G. McMILLAN, B.A.Sc.	Fellow in Mining, Toronto, Ont. School of Practical Science.
3.	L. HAUN MILLER.....	With Wellman-Sever & Morgan En- Cleveland, O. gineering Co.
2.	E. V. NEELANDS, B.A.Sc.	Fellow in Surveying, Toronto, Ont. School of Practical Science.
1.	*E. H. PHILLIPS, D.L.S.	Topographical Surveys Branch, Ottawa, Ont. Dept. of the Interior.
2.	J. R. ROAF, B.A.Sc.	Draftsman, Crows' Nest Pass Coal Ferne, B.C. Co.
3.	*C. H. E. ROUNTHWAITE	Asst. Superintendent Canadian Elec- Sault Ste. Marie, Ont. tro-Chemical Co., Limited.
2.	H. W. SAUNDERS, B.A.Sc.	Engineering Dept. Cambria Steel Co. Johnstown, Pa.
1.	A. TAYLOR	With C. P. R. Land Department. Winnipeg, Man.
1.	W. C. TENNANT, B.A.Sc.....	Fellow in Civil Engineering, Toronto, Ont. School of Practical Science.
2.	S. M. THORNE, B.A. Sc	Engineering Staff, Ontario Niagara Falls, Ont. Power Co.
1.	F. W. THOROLD, B.A.Sc.	City Engineer. Calgary, Assa.
1.	H. M. WEIR, B.A. Sc	With Cleveland Gas, Light and Cleveland, O. Coke Co.
3.	F. D. WITHROW	Inspector of Materials for Illsley Toronto, Ont. & Horn, King Edward Hotel.

* Diploma with honors.

1901

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	R. H. BARRETT, B.A.Sc., O.L.S..	Office of J. L. Morris, Engineer and Pembroke, Ont. Surveyor.
3.	W. G. BEATTY,	Manager, Beatty Bros. Implement Fergus, Ont. Manufacturers.
3.	G. M. BERTRAM	Office of Sullivan Machinery Co. 71 Broadway, New York.
3.	W. J. BOWERS	Office of Willis Chipman, C.E. Toronto, Ont.
3.	E. T. J. BRANDON, B.A.Sc... ..	Engineering Staff, Ontario Niagara Falls. Power Co.
3.	W. P. BRERETON	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	J. T. BROUGHTON.....	Draftsman, Mesta Machine Co. Pittsburgh, Pa.
3.	*W. G. CHACE	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	A. G. CHRISTIE	Erecting Engineer, Westinghouse Pittsburgh, Pa. Machine Co.
3.	J. R. COCKBURN, B.A. Sc.....	Draftsman, Polson Iron Works. Toronto, Ont.
1.	W. A. DUFF	Draftsman, The Kenwood Bridge Co. Grand Crossing, Ill.
2.	*D. E. EASON, B.A. Sc.	Engineering Staff, Trent Valley Canal. Peterboro, Ont.
1.	*S. GAGNÉ.....	Post-Graduate Course, Grand Forks, B.C. School of Practical Science.
3.	N. R. GIBSON	Draftsman, Jenckes Machine Co. Sherbrooke, P.Q.
1.	C. HARVEY, B.A. Sc.....	Asst. Surveyor to G. B. Abrey, D.L.S. Indian Head, Assa. in N.W.T.
2.	A. T. E. HAMER	Assayor, Rock Lake Mining Co. Bruce Mines, Ont.
2.	F. C. JACKSON.....	Res. Engineer, Temiskaming Ry. North Bay, Ont.
3.	*A. LAIDLAW.....	Engineering Staff, National Portland Toronto, Ont. Cement Co.
3.	W. C. LUMBERS	Draftsman, C.P.R. Engineer's Office. Toronto, Ont.
3.	A. C. MACDOUGALL	Draftsman, Pittsburgh Reduction Co. Pittsburgh, Pa.
3.	A. T. C. McMASTER.....	Draftsman, Cramp Steel Co. Collingwood, Ont.

* Diploma with honors.

1901—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1.	G. MACMILLAN	Engineering Staff, Canadian Northern Ry. Winnipeg, Man.
3.	*H. G. McVEAN, B. A. Sc.	Demonstrator in Mechanical Engineering, School of Practical Science. Toronto, Ont.
2.	W. C. MATHESON	Assayer, Canadian Gold Fields Co. Delora, Ont.
3.	H. T. MIDDLETON	Draftsman, Pittsburgh Reduction Co. Pittsburgh, Pa.
2.	J. L. R. PARSONS, B.A.	Asst. Surveyor to H. D. Sewell, Battleford, Sask. D.L.S.
1.	G. H. POWER	Office of Willis Chipman, C.E. Toronto, Ont.
3.	*H. W. PRICE, B. A. Sc.	Demonstrator in Electrical Engineering, School of Practical Science. Toronto, Ont.
1.	H. P. RUST, B. A. Sc.	Engineering Staff, Canadian Niagara Niagara Falls, Ont. Power Co.
3.	M. V. SAUER, B. A. Sc.	Fellow in Electrical Engineering, Toronto, Ont. School of Practical Science.
3.	W. H. STEVENSON, B. A. Sc.	Construction Engineer, Electrical Buffalo, N.Y. Dept., Lackawanna Steel Co.
1.	R. D. WILLSON	Engineering Staff, Canadian Northern Winnipeg, Man. Ry.

1902

3.	*H. G. BARBER	Assistant City Engineer. Guelph, Ont.
1.	W. J. BLAIR	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	J. M. BROWN	With Westinghouse Machine Co., Pittsburgh, Pa. Steam Turbine Dept.
2.	W. G. CAMPBELL	Construction Dept., Lackawanna Steel Buffalo, N.Y. Co.
2.	A. R. CAMPBELL	Asst. Engineer on Dry Docks. Sault Ste. Marie, Ont.
2.	*W. CHRISTIE	Post-Graduate Course, Toronto, Ont. School of Practical Science.
2.	F. T. CONLON	With J. & T. Conlon. Little Current, Ont.
3.	H. V. CONNOR	Post-Graduate Course, Toronto, Ont. School of Practical Science.
2.	*M. T. CULBERT,	Post-Graduate Course, Toronto, Ont. School of Practical Science.

* Diploma with honors.

1902—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
2.	R. CUMMING	Post-Graduate Course, Montreal, Que. McGill University.
1.	W. E. DOUGLAS, B.A.	Office of Willis Chipman, C.E. Toronto, Ont.
3.	*R. J. DUNLOP	With Westinghouse Electric and Pittsburg, Pa. Manufacturing Co.
2.	W. M. EDWARDS	Office of J. H. Moore, O. L. S., Smith's Falls, Ont. Town Engineer.
3.	W. ELWELL	Post-Graduate Course, Toronto, Ont. School of Practical Science.
2.	J. M. EMPEY	Post-Graduate Course, Toronto, Ont. School of Practical Science.
2.	*D. L. H. FORBES	Asst. Mining Engineer, Minnesota Eveleth, Minn. Iron Co.
1.	*A. E. GIBSON	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	A. C. GOODWIN	Draftsman, Pittsburgh Reduction Co. New Kensington, Pa.
3.	C. HENWOOD	With Edgar Thompson Steel Plant. Pittsburgh, Pa.
3.	D. M. JOHNSTON	Draftsman, United Electric Co. Toronto, Ont.
2.	R. H. KNIGHT	Post-Graduate Course, Toronto, Ont. School of Practical Science.
5.	*F. L. LANGMUIR	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	A. H. MCBRIDE	Fellow in Drawing, Toronto, Ont. School of Practical Science.
1.	A. L. MCLENNAN	Office of J. McDougall, C.E., York Toronto, Ont. Co. Engineer.
3.	J. T. MACKAY	With Canadian General Electric Co., Peterboro, Ont. Testing Dept.
3.	J. F. S. MADDEN	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	*C. H. MARRS	Draftsman, Hamilton Bridge Works Hamilton, Ont. Co.
3.	P. MATHISON	Post-Graduate Course, Toronto, Ont. School of Practical Science.
3.	R. S. MENNIE	Draftsman, Riter-Conley Mfg. Co. Pittsburgh, Pa.
2.	H. H. MOORE	Topographical Survey's Branch, Ottawa, Ont. Department of the Interior.

* Diploma with honors.

1902—Continued.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1. *T. S. NASH.....	Topographical Survey's Branch, Ottawa, Ont.	Department of the Interior.
1. G. C. POWELL.	Post-Graduate Course, Toronto, Ont.	School of Practical Science.
1. *W. F. RATZ.....	Topographical Survey's Branch, Ottawa, Ont.	Department of the Interior.
3. H. D. ROBERTSON.....	Post-Graduate Course, Toronto, Ont.	School of Practical Science.
3. *D. SINCLAIR.....	Post-Graduate Course, Toronto, Ont.	School of Practical Science.
2. *I. J. STEELE.....	Topographical Survey's Branch, Ottawa, Ont.	Department of the Interior.
3. W. H. SUTHERLAND.....	Post-Graduate Course, Toronto, Ont.	School of Practical Science.
3. *T. TAYLOR.....	Structural Department, Riter-Conley Pittsburgh, Pa.	Manufacturing Co.
2. C. M. TEASDALE.....	Post-Graduate Course, Toronto, Ont.	School of Practical Science.
3. A. A. WANLESS.....	Engineering Staff, Nova Scotia Steel Sydney Mines, N.S.	and Coal Co.
3. H. J. ZAHN.....	Post-Graduate Course, Toronto, Ont.	School of Practical Science.

CERTIFICATES.

METALLURGY AND ASSAYING.

COURSE.	NAME AND ADDRESS.	OCCUPATION.
1896. G. JOHNSTON.....		
1896. A. T. TYE.....		
1897. E. B. WEBSTER.....		
1898. A. N. McMILLAN.....	Penetanguishene, Ont.	
1900. A. H. SMITH.....	Mining Engineer, Los Reyes Gold Mining & Milling Co.	
1901. G. A. HUNT.....		

ELECTRICITY.

1896. E. I. SIFTON.....	Manager, London Electric Construc- tion Co.
-------------------------	--

* Diploma with honors.

INDEX TO GRADUATES.

In the following alphabetical list of the Graduates is given the year of graduation of each student. In the preceding list, which is arranged by classes in the order of graduation, may be found additional information as to occupation, addresses, etc.

A

Alison, T. H.....	1892	Apsey, J. F.	1888
Allan, J. R.	1892	Ardagh, J. A.	1893
Allan, J. L.	1900	Ardagh, E. G. R.	1900
Anderson, A. G.	1892	Armstrong, J.....	1895
Andrews, E.	1897	Ashbridge, W. T.....	1888
Angus, R. W.	1894		

B

Bain, J. A.	1900	Bowman, H. J.....	1885
Bain, J. W.	1896	Bowman, A. M.....	1886
Ball, E. F.....	1888	Bowman, F. M.	1890
Ballantyne, H. F.	1893	Boyd, D. G.....	1894
Barber, H. G.....	1902	Boyd, W. H.	1898
Barber, T.	1899	Brandon, E. T. J.	1901
Barker, H. P.....	1893	Bray, L. T.....	1900
Barley, J. H.	1900	Brebner, G.....	1895
Barrett, R. H.....	1901	Brereton, W. P.	1901
Beatty H. J.	1890	Brodie, W. M.....	1895
Beatty, W. G.	1901	Broughton, J. T.....	1901
Beauregard, A. T.	1894	Brown, J. M.	1902
Bergey, A. E.....	1894	Brown, D. B.	1888
Bertram, G. M.	1901	Brown, G. L.	1893
Blackwood, A. E.	1895	Brown, L. L.	1895
Blair, W. J.....	1902	Bucke, M. A. (deceased) . . .	1890
Bleakely, F. W.....	1885	Bucke, W. A.	1894
Boswell, E. J.....	1895	Burns, D.	1883
Boswell, M. C.....	1900	Burns, J. C. (deceased).....	1887
Boustead, W. E. (deceased) .	1890	Burnside, J. T. M.....	1899
Bow, J. A.	1897	Burwash, L. T.....	1896
Bowers, W. J.....	1901		

C

Campbell, W. G.....	1902	Carey, B.	1889
Campbell, A. R.	1902	Carpenter, H. S.	1897
Campbell, R. J.....	1895	Carter, W. E. H.	1898
Campbell, G. M.....	1896	Chace, W. G.....	1901
Canniff, C. M.	1888	Chalmers, W. J.....	1889

C

Chalmers, J.	1894	Cockburn, J. R.	1901
Charlesworth, L. C.	1893	Conlon, F. T.	1902
Charlton, H. W.	1897	Connor, H. V.	1902
Chewitt, H. J.	1888	Connor, A. W.	1895
Christie, W.	1902	Cooper, C.	1899
Christie, A. G.	1901	Corrigan, G. D. (deceased) ..	1890
Chubbuck, L. B.	1899	Coulthard, R. W.	1899
Clark, J.	1900	Craig, J. A.	1899
Clement, W. A.	1889	Culbert, M. T.	1902
Clothier, G. A.	1899	Cumming, R.	1902

D

Darling, E. H.	1898	Dobie, J. S.	1895
Davison, J. E.	1900	Douglas, W. E.	1902
Deacon, T. R.	1891	Duff, J. A. (deceased) ..	1890
DeCew, J. A.	1896	Duff, W. A.	1901
Dickinson, E. D.	1900	Duggan, G. H.	1883
Dickson, G. W.	1900	Dunlop, R. J.	1902
Dill, C. W.	1891	Dunn, T. H.	1893
Dixon, H. A.	1900		

E

Eason, D. E.	1901	Elwell, W.	1902
Edwards, W. M.	1902	Empey, J. M.	1902
Elliott, H. P.	1896	English, A. B. (deceased) ..	1890
Elliot, J. C.	1899	Ewart, J. A.	1894

F

Fairbairn, J. M. R.	1893	Forman, W. E.	1899
Fairchild, C.	1892	Forward, E. A.	1897
Fingland, W.	1893	Francis, W. J.	1893
Forbes, D. L. H.	1902	Fullerton, C. H.	1900
Forester, C.	1893		

G

Gagné, S.	1901	Goodwin, J. B.	1892
Garland, N. L.	1890	Grant, W. F.	1898
Gibbons, J.	1888	Gray, A. T.	1897
Gibson, A. E.	1902	Guernsey, F. W.	1895
Gibson, N. R.	1901	Gurney, W. C.	1896
Goldie, A. R.	1893	Guest, W. S.	1900
Goodwin, A. C.	1902	Guy, E.	1899

H

Haight, H. V.....	1896	Henderson, S. E. M.....	1900
Hamer, A. T. E.....	1901	Henry, J. A.	1900
Hanly, S. C.	1893	Henwood, C.	1902
Hanning, G. F.	1889	Herald, W. J.....	1894
Hare, W. A.	1899	Hermon, E. B.	1886
Harkness, A. H.....	1895	Hicks, W. A. B.....	1897
Harvey, C.	1901	Holcroft, H. S.	1900
Haultain, H. E. T.....	1889	Hull, H. S.	1895
Hemphill, W.....	1900	Hutcheon, J.	1890
Henderson, E. E.	1885		

I

Innis, W. L.	1890	Irvine, J.....	1889
-------------------	------	----------------	------

J

Jackson, F. C ...	1901	Johnston, A. C.....	1894
James, O. S.....	1891	Johnston, S. M.....	1894
Jâmes, D. D.	1889	Johnston, H. A....	1900
Jeffrey, D.	1882	Johnston, J. C.	1900
Job, H. E.	1894	Johnston, J. A.	1900
Johnston, D. M.....	1902	Jones, J. E.....	1894

K

Keele, J.	1893	Kirkland, W. C.....	1884
Kennedy, J. H.....	1882	Korman, T. S.	1898
King, C. F.....	1897	Knigh, R. H.....	1902

L

Laidlaw, J. T.....	1893	Lash, N. M.....	1894
Laidlaw, A....	1901	Latham, R.	1899
Laing, W. F.	1896	Lavrock, J. E.	1898
Laing, A. T.	1892	Lawson, W.....	1892
Laird, R.....	1886	Lawrie, R. R. (deceased)....	1896
Lane, A.	1891	Lea, W. A.	1892
Langmuir, F. L.....	1902	Lott, A. E.....	1887
Langley, C. E.	1892	Ludgate, B. A.	1885
Laschinger, E. J.....	1892	Lumbers, W. C.....	1901
Lash, F. L.....	1893		

Mac

MacBeth, C.	1896	Macallum, A. F.	1893
MacKay, J. T.....	1902	Macdougall, A. C.....	1901
MacMillan, C.....	1901	Mackintosh, D.	1898

Mc

McAllister, J. E.	1891	McKay, O.	1885
McAllister, A. L.	1893	McKay, W. N.	1895
McAree, J.	1882	McKinnon, H. L.	1895
McArthur, R. E.	1900	McLennan, A. L.	1902
McBride, A. H.	1902	McMaster, A. T. C.	1901
McCulloch, A. L.	1887	McMillan, J. C.	1900
McDougall, J.	1884	McMurchy, J. A.	1896
McDowall, R.	1888	McNaughton, F. W.	1898
McEntee, B.	1892	McPherson, A. J.	1893
McFarlen, G. W.	1888	McTaggart, A. L.	1894
McFarlen, T. J.	1893	McVean, H. G.	1901
McGowan, J.	1895		

M

Madden, J. F. S.	1902	Middleton, H. T.	1901
Main, W. T.	1893	Mill, F. X. (deceased) . . .	1889
Marani, C. J.	1888	Miller, L. Haun.	1900
Marani, V. G.	1893	Milne, C. G.	1892
Marrs, C. H.	1902	Mines, W.	1893
Martin, F.	1887	Minty, W.	1894
Martin, T.	1896	Mitchell, C. H.	1892
Matheson, W. C.	1901	Moberly, H. K.	1889
Mathison, P.	1902	Monds, W.	1899
Meadows, W. W.	1895	Moore, H. H.	1902
Mennie, R. S.	1902	Moore, J. H.	1888
Merrill, E. B.	1890	Moore, J. E. A.	1891
Mickle, G. R.	1888	Morris, J. L.	1881

N

Nash, T. S.	1902	Newman, W.	1891
Neelands, E. V.	1900	Nicholson, C. J.	1894

P

Parsons, J. L. R.	1901	Pope, A. S. H.	1899
Patterson, J.	1899	Powell, G. G.	1902
Pedder, J. R. (deceased) . . .	1890	Power, G. H.	1901
Phillips, E. H.	1900	Prentice, J. M. (deceased) . .	1892
Pinhey, C. H.	1887	Price, H. W.	1901
Playfair, N. L.	1892	Proudfoot, H. W.	1897

R

Ratz, W. F.	1902	Robertson, H. D.	1902
Raymer, A. R.	1884	Robertson, J.	1884
Revell, G. E.	1899	Robertson, J. M.	1893
Richards, E.	1899	Robinson, J. K. (deceased) . .	1891
Richardson, G. H.	1888	Robinson, F. J.	1895
Roaf, J. R.	1900	Robinson, A. H. A.	1897

R

Rogers, J.	1887	Ross, J. A.	1892
Rolph, H.	1894	Rounthwaite, C. H. E.	1900
Rose, K.	1888	Russel, W. B.	1891
Roseburgh, T. R.	1889	Russel, R.	1893
Ross, J. E.	1888	Rust. H. P.	1901
Ross, R. A.	1890		

S

Sauer, M. V.	1901	Smith, A.	1894
Saunders, G. A.	1899	Smith, R. W.	1898
Saunders, H. W.	1900	Speller, F. N.	1893
Scott, W. F.	1897	Spotton, A. K.	1894
Shanks, T.	1899	Squire, R. H.	1893
Shaw, J. H.	1898	Steele, I. J.	1902
Shields, J. D.	1894	Stern, E. W.	1884
Shipe, R. R.	1896	Stevenson, W. H.	1901
Shipley, A. E.	1898	Stewart, J. A.	1898
Silvester G. E.	1891	Stocking, F. T.	1895
Sinclair, D.	1902	Stull, W. W.	1897
Smallpeice, F. C. .	1898	Sutherland, W. H.	1902
Smiley, R. W. .	1897	Symmes, A. D.	1891
Smith, A. N.	1892		

T

Taylor, T.	1902	Taomson, R. W.	1892
Taylor, W. V.	1893	Thorne, S. M.	1900
Taylor, A.	1900	Thorold, F. W.	1900
Teasdale, C. M.	1902	Tremaine, R. C. C (deceased)	1895
Tennant, D. C.	1899	Tyrrell, J. W.	1883
Tennant, W. C.	1900	Tyrrell, H. G.	1886
Thomson, T. K.	1886		

V

VanEvery, W. W.	1899	Vercoe, H. L.	1898
----------------------	------	--------------------	------

W

Wanless, A. A.	1902	Wiggins, T. H.	1890
Watson, R. B.	1893	Wilkinson, T. A.	1898
Watts, G.H.	1899	Williamson, D. A. .	1898
Wagner, W. E.	1899	Willson, R. D.	1901
Weekes, M. B.	1897	Withrow, W. J.	1890
Weir, H. M.	1900	Withrow, F. D.	1900
Weldon, E. A.	1897	Wright, C. H. C.	1888
White, A. V.	1892	Wright, R. T.	1894
Wickett, T....	1889		

Y

Yeates, E.	1899
-----------------	------

Z

Zahn, H. J .	1902
--------------	------

